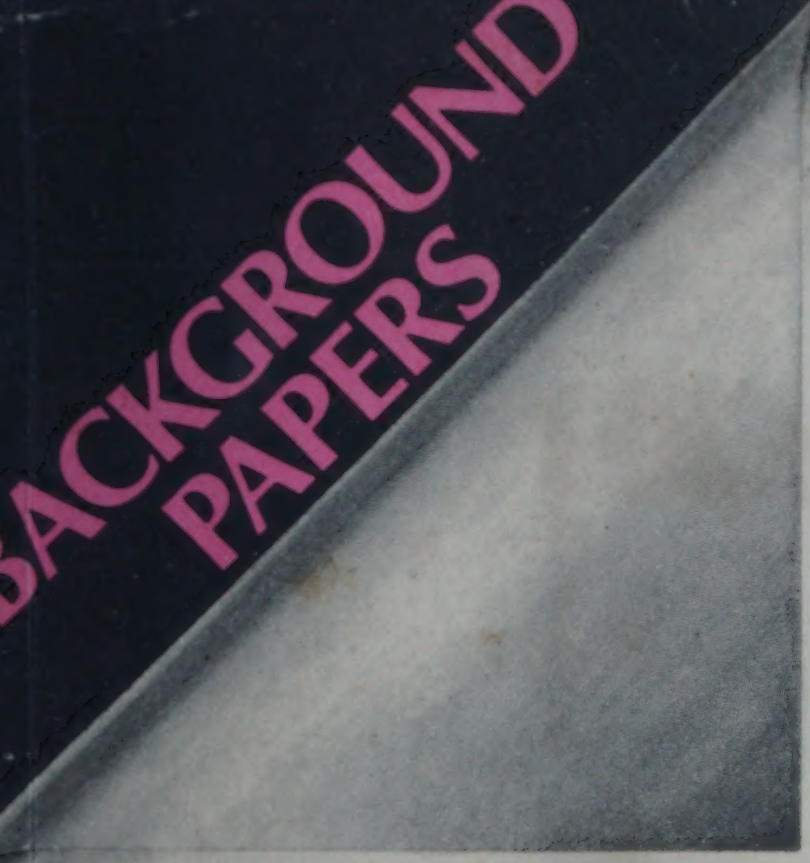

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Occupational Health

by

Bharat Dogra

(For Private Circulation Only)

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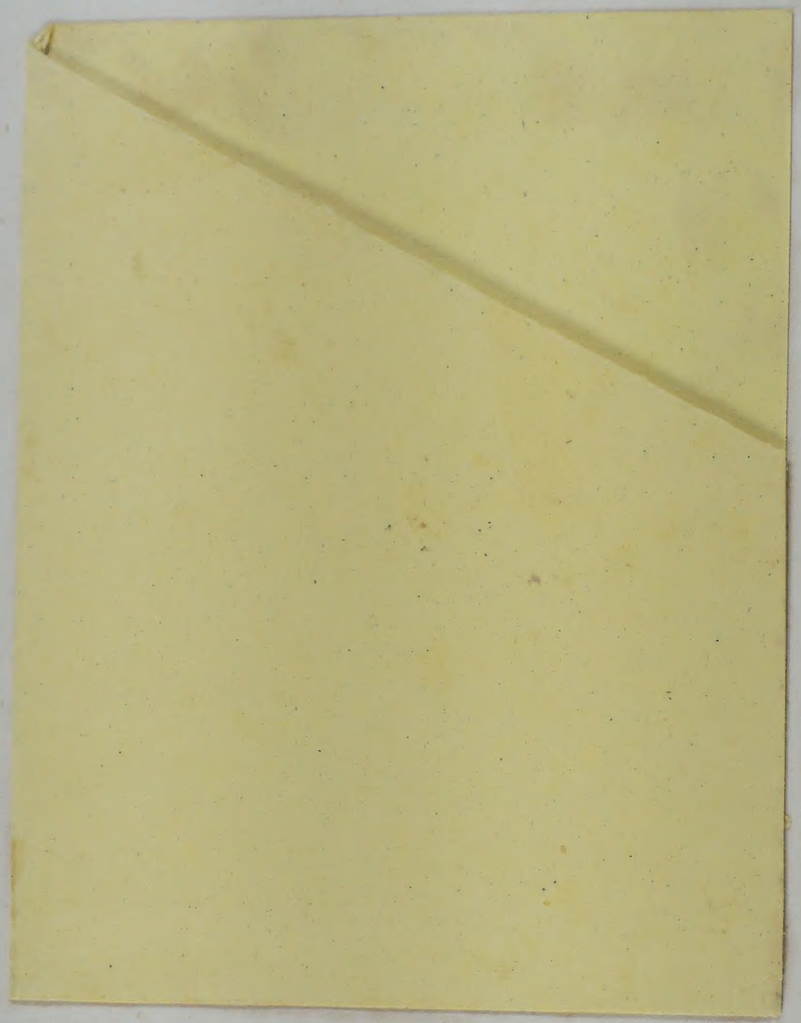

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Preface

Occupational health is not yet recognised widely as a vital aspect of public health in the country. Only in recent years has the Government devoted attention and taken action to control dangerous working conditions at workplaces. Similarly, groups and social activists and organisations have realised the relevance of occupational health as an important area for action.

Much of the country's industrial development has occured in industries in which workers are exposed to significant health hazards. It is they who produce the steel, dig wells and canals, operate harvesting machines and implements, crush stones and mine coal and other minerals. All this is done even after being denied some of the usual rights due to them including basic needs and services like housing, sanitation, etc.

Much of the information on the effects of occupational hazards consists primarily of piecemeal studies or reports that fail to measure the relative risk of disease or death. Only the prevalance of a particular disease or health effort in a segment of the exposed population at one point of time receive attention. Nevertheless, these reports do provide useful information in understanding the seriousness of the problem. This is all the more true in the wake of the recent mass carnage caused apparently by a gas leak at Bhopal which killed thousands of lives. As such, this has led to pertinent observations of various aspects of the problem hitherto overlooked or unseen.

It has been estimated that in industrial accidents alone i. e. only the factories, about four lakh workers suffer injuries with almost a thousand dying. There is also a severe lack of adequate control of occupational and enviromental exposure. Few health standards and guidelines are applied to restrict workplace exposures. Where standards regulating work practices or exposure, for instance to poisonous gases, do exist, they often are not enforced for political reasons or because of deficiently trained officials.

In the wake of the carnage that overtook Bhopal it has been noted that worker-consciousness on occupational health hazards, especially among the unorganised

sector like mining, lumbering, agriculture, etc., is very low. Knowledge about diseases closely linked to specific industries, trade or occupation is even less so. Workers, in especially the unorganised sectors, are also blank on vital issues that affect their overall health and hence very existence. Even the most convention-bound trade unions and unionists are mostly uninformed regarding this aspect. The need and relevance of their right to safety precautions and guidelines, etc., including a proper grasp of the measures and their implications seldom or ever represent part of their usual struggles. A critical appraisal or confrontation of notions including values and proposals — subtly inculcated or imposed into their consciousness by the employers — is woefully absent.

On the other hand, the response of the management to occupational health is based primarily on the profit motive, costs involved and the extent of the clout unions hold. Thus, in line with these considerations their notion has ranged from outright abuse of health and safety precautions of the Factories Act in collusion with officials to punitive measures against workers; from back-door lobbying and manipulations including co-opting tactics, to legal steps that operate in their favour. Such managerial manoeuvres are resorted to avoid factory registrations, non-submission of returns and records to workshop inspection centres, flouting limits for toxic elements and dust, and giving the blind eye to appropriate pollution-control measures and the wilful use of redundan machines, neglect of cleanliness and sanitation measures, including the holding of regular medical checkups for workers. In certain industries the management for processing purposes keep the temperatures high. Such high exposures of temperatures affect the workers' capacity to work leading to such complications as heat strokes, heat cramps and heat exhaustion.

All these transgressions are done knowingly with the active connivance of inspection officers through personal and political favours and bribes. The recent incident of mass carnage at Bhopal is an illustration of this. The pesticides plant of the transnational, Union Carbide, was issued a notice by a municipal administrator in 1975. The factory subsequently donated Rs. 25,000 to the Corporation for building a park. As a result, the notice remained in the municipal file, the plant stayed put and it was the administrator who was told to quit.

Further, the management also do not reveal information on various aspects of workers' production — the type of material used and their impact on health, the number of accidents, dangerous sites, pollution control records, toxicity levels, accident reports, factory assessment and medical reports and recommendations for improvement made by factory officers and government agencies. This again is the case of the recent criminal accident at Union Carbide which supposedly is one of the few companies with an impeccable track record of safety precautions against accidents at workplaces.

The same sordid practices apply to health and safety demands. They browbeat workers by stressing that occupational hazards are a 'fait accompli' whilst colluding with medical institutions to manipulate medical reports, keeping the workers fobbed off with medicants and milk. Divisive tactics and other mischievous means are also resorted to — like transferring workers, restricting their movement or shunting them off on some

training course or the other; prohibiting them from visiting other plants and so on. It is an open secret that doctors employed by them are very often in their ploy and even if instances of violations are uncovered these are ultimately confided to a select few of top management. Other doctors are also reluctant to certify any illness as occupational diseases as they risk getting into bad books with the Company and thereby their services being terminated. Gross violations and nefarious activities are also covered up. For instance the Birla-owned Rayon Silk Mills at Nagda, M. P. was involved in a criminal accident in which at least 15 workers died of poisonous gas. The case was taken up by a civil liberties group, PUCL, in the form of an investigative report (see "Occupational hazards in Rayon Industry"). The owners of this mill countered this Report by a massive propaganda campaign but was challenged by another human rights group, PUDR, who warned the owners of filing a writ petition against them. Till date no action has been taken against the offending Company by the Government.

In dealing with certain sensitive and highly dangerous substances, the management invariably passes the job and responsibility to outsiders. They employ unorganised, casual labour — usually ignorant and poor adivasis — to handle nuclear waste, for instance. In this way they succeed in craftily avoiding confrontation with Unions

In the light of these facts the question, therefore, of eliminating accidents and death to workers and radically improving their overall health conditions naturally emerges. No doubt, this is a highly crucial and important concern. The answer however is that increasing mechanisation and automation — within the current social, economic and environmental conditions — will lead to workers facing greater occupational dangers and even death. Whatever attempt to resolve this issue even by the authorities in the Government will, at best, merely be patchwork or a form of amelioration. Indian society being what it is, workers are forced to sell their labour-power i. e. the aggregate of the physical and mental capacities which he utilises whenever he produces material wealth for the industrialists. In other words, the workers's labour power becomes a **commodity.** The issue can only be settled when the worker in his present state — as a mere appendage to his job i. e. the machine, a 'cog in the wheel' — is freed from the alienating and degrading nature of his work into one where there is recognition, dignity and creativity and where he does not work for the private owner but for the good of the whole society. At this juncture of Indian history, such a situation is not yet on the horizon.

In the circumstances, therefore, the best that **can** be achieved against such criminal acts and occupational hazards in general and towards a pollution-free environment is to unite civil liberties and democratic rights groups all over the country along with environmentalists, workers and concerned scientists. The struggle is basically two-fold. Whilst unitedly pressing for the strict implementation — and, where necessary, to initiate action — for greater safety, for all-round health of the worker — the "wider struggle has to be for changing this system".

BUILD Documentation Collective.

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Industrial Accidents

1. INDUSTRY :

During the decade 1965-75, according to officially published statistics, over 5,000 workers were killed and over 25 lakh workers were injured in industrial accidents. In 1980, the latest year for which statistics are available, 806 workers were killed and 3.5 lakh workers were injured in industrial accidents. During 1979 for every 1,000 workers 64 were affected by industrial accidents. (For more details see Tables 1 and 2). However there are good reasons to believe that these official statistics underestimate the tragedy of industrial accidents to a substantial extent.

The statistics in the above Tables do not cover the injuries caused in industrial units employing less than 20 persons (without electricity) or 10 persons (with electricity). The data on injuries relates to factories submitting returns and no estimate of injuries have been made for the defaulting factories. Only about 65 percent of the factories are known to submit these returns. Moreover only those injuries which result in the absence of workers from the workplace for more than 48 hours are taken into account.

Often the injuries suffered by casual and contract labourers are not reported. Yet in one study, contract workers who formed 25 percent of a large iron and steel unit were found to have a frequency rate of accidents 3.5 times, and a severity 2.5 times that of regular employees.

Table - 1

Industrial Injuries in Factories

Year	Fatal Injuries	Non-Fatal Injuries
1950	248	72,000
1954	267	94,000
1958	369	1,36,000
1962	528	1,68,750
1966	591	2,08,250
1970	613	2,87,560
1975	650	2,48,460
1978	776	3,46,000
1980	806	3,56,000

Note : Statistics from 1961 to 1975 are given in Indian Labour Statistics, 1977, Labour Bureau, page 212 while those for other years are derived from other official sources.

Table - 2

Industrial Injuries in Factories

Year	Incidence of Injuries (Per 1,000 workers)	
	Fatal	Non-Fatal
1961	0.14	45.53
1966	0.15	51.18
1971	0.15	75.52
1975	0.14	45.53
1976	0.17	61.37
1977	0.14	63.81
1978	0.15	68.62
1979	0.15	63.87

Note : Statistics from 1961 to 1975 are from Indian Labour Statistics, 1977, Labour Bureau and those from 1976 to *1979 are from the Pocket Book of Labour Statistics, 1982, Labour Bureau.

It is not possible for the ill-staffed and ill-equipped factory inspectors to check the informatian provided by the various factories. The internationally accepted form is to have one inspector per 150 factories. In India a labour inspector on the average has to cover nearly 300 factories. 25 percent of the factories are not inspected even once in a year while among those inspected* only half are inspected more than once.

It appears absurd to say, as the official statistics do, that during 1975 not a 'single injury' was caused in forest logging and agricultural production, that only 39 injuries were caused in construction and only 7 in sanitary services and that only 497 industrial injuries were caused by 'gassing' during this year in the entire country. For a well-known factory employing over 25,000 workers., the statistics of accidents given by a high placed official differed from those provided by the head office by a margin of over 30 percent for* one year and over 60 percent for the next.

According to N. L. Gadkari, former Chief Inspector of Factories, Maharashtra, "Far more accidents go unreported than are reported. It is my experience that an inspector who may decide to act against employers has to. reckon with a good amount of social and political pressure". He does not tell us in greater detail about this social and political pressure but he states categorically that in reporting an accident, the worker who picks up enough courage to give evidence against his employer is sure to face harassment and loss of job.

Despite the fact that official statistics are a gross underestimate of the actul number of industrial accidents, even these statistics clearly show that not only the number of accidents but also the incidence of accidents has been showing a rising trend.

From 1951 to 1978 the average daily employment in factories has increased only by 120 per cent, the number of fatal injuries increased by 225 and non-fatal injuries by 393 per cent. In Maharashtra, while employment rose by 40 per cent during 1961 to 1978, injuries rose by over 100 per cent.

In western countries often concern is expressed about the high rate of industrial accidents where as in India the rate is much higher. In 1976, for instance, there were 61 accidents per 100 workers in India compared to 25 in the USA.

The textiles industry, with 24 per cent of total industrial employment in the country, has the highest

share of 54 percent of injuries. The incidence of industrial injuries in factories is the highest among textiles workers, being 127 (per 1000 workers) in "all textiles" in 1979, compared to 68 in transport equipment workers and 58 among metal-product workers.

By far the largest number of accidents take place in the textile, industry. In 1975 for instance, nearly half of the total number of accidents, over one lakh, (out of a total of a little over 2 lakh,) took place in textiles (including cotton, jute, hemp and mesta textiles). Other industries which account for a high share of injuries include metals and alloys and metal products (nearly 21,000), manufacture of machinery and machinery tools including electrical machines (19,000) and manufacture of transport equipment (nearly 17,500).

In a research paper Dr. B. B. Joshi has given the following comprehensive picture of the various ways in which the hands of the textile workers are injured. "The textile machines have varied complexes in producing finished cloth from raw cotton. We have the opening and blow rooms machinery, horizontal and vertical heaters, lap rollers, belts and pulleys, cog wheels, cage wheels, cane feeders, etc. The injury caused by all these machines is of the crushing type and in addition the tearing force which makes pulp of the involved tissues..... .....there is the card rooms machinery which is used in the aerial process of separating and combing operations of the cotton fibres. These machines have a common characteristic of a roller drum or a convoy belt studed with fine spikes. These do the job of making the cotton fluffing before it is fed to spin yarn. These spike rollers produce a characteristic shredding injury involving the skin, tendons, nerves, vessels and joints.

"Another characteristic and extensive damage caused in the textiles mills is the injury caused by the callender machines where the cloth is fed after starching and drying. In these injuries there is not only a contact burn of the hand but also compression injuries of the hands and fingers when these are caught between the mobile rollers and other rollers of these machines. Very often the entire arm is dragged in. The extent of the injury depends not on the temperature of the rollers which in these cases is mostly at 110-120°C but also on the period of contact between the pressure exerted by the rollers over the part. When the gap between the rollers is less, the finger and the hands are crushed and then ironed out and desicated, resulting in mumification of the involved part, when the gap is wide enough for the hands to move in, the maximum burden falls on the wrist, fore-arm and elbows. As the arm is dragged in further, even the axilla is involved, the fracture may also be associated in the upper extremities due to pressure effect of these rollers".

Incidence of industrial injuries in factories varies from 4 in Karnataka to 236 in Madhya Pradesh. Other States where this incidance is high are Maharashtra (78), and Gujarat (70). (Statistics for 1979). However a sizeable part of the variation in the incidence of industrial accidents in different States may be due to differences in the effectiveness of reporting these accidents.

Table - 3

INDUSTRIAL INJURIES IN FACTORIES BY CAUSES, 1961-1975.

S. No.	Cause	Total
1.	Prime movers	202
2.	Machinery moved by Mechanical power including.	57,653
a)	Transmission Machinery	2,744
b)	Lifting Machinery	778
c)	Machine Tools for Metal Working	9,279
d)	Wood Working Machinery	742
e)	Other Machinery moved by Mechanical Power.	44,110
3.	Machinery not moved by Mechanical power.	3,533
4.	Transport whether moved by *Power or not including.	3,447
a)	Railways	467
b)	Others	2,980
5.	Electricity	994
6.	Explosions	322
7.	Fires	1,007
8.	Gassing	497
9.	Molten Metals and other Hot or Corrosive Substances	6,813
10.	Hand Tools	16,675
11.	Falling Bodies	22,907
12.	Persons Falling	9,825
13.	Stepping on or striking against objects	20,506
14.	Handling Goods or Articles	25,292
15.	Others	40,212
	Total	209,885

Indian Factories Act :

In the discussion on the reduction of industrial accidents, the question of the adequacy and effectveness of the existing safety legislation as incorporated in the Indian Factories Act is ofter raised. The safety provisions as included in this Act are briefly summarised below :

Fairly detailed safety precautions have been laid down in the Factories Act, 1948, to protect the workers. Regarding the fencing of machinery, for instance, it has been laid down that every moving part of a prime mover, the headrace and tailrace of every Water wheel and water turbine, any part of stock bar which projects beyond the head stock of a lathe and dangerous parts of other machinery shall be accurately fenced by safeguards of substantial construction. Safeguards such as wearing tight-fitting clothes, have also been laid down for all workers who have to examine and attend to machinery in motion. Only well-trained persons can be employed on dangerous machines (or at least they must be under adequate supervision of an experienced or well trained person).

Similarly, requirements for encasing electricity driven machinery used in the process of grinding have been laid down. Several precautions relating to the installation and use of lifts and hoists, and other lifting-machines have been specified. Similarly regarding floors, stairs and passages, pits and openings in floors, etc., precautions to be followed in case of plants or machines working in abnormal pressure or emitting dangerous fumes have also been laid down. In the latter case adequate man-holes have to be provided in the dangerous zone; workers must be equipped with suitable breathing apparatus. Reviving apparatus and belt and ropes for pulling out workers from dangerous places are also necessary.

In factories where any manufacturing process produces dust, gas explosives or inflamable dust or gas, the Act stipulates effective enclosures of the plant or machinery used in the process, removal or the prevention of accumulation of dust or gas and exclusion or effective enclosure of all possible ourcess of ignition. Instructions for checking the spread of any explosion and for preventing and controlling fire have also been listed. If the inspector finds a building, plant or machinery to be a safety-hazard, he can carry out tests on it, elicit more information about it from the owner, specify the measures to improve the safety standard and also prohibit its use till such time as the required improvements have been carried out.

These provisions of the Factories Act have to be applied to a broad range of factories using a wide diversity of machinery and production processes. The working conditions in the different industries have to be researched and proper norms regarding the control of poisonous gases, possibilities of explosion and risk of injury from dangerous machines and production processes have to be evolved. This follow-up work has not received the due attention, with the result that the available information regarding the safety norms and conditions in various industries is very inadequate.

The extent to which the inadequacy of the existing legislation should be blamed vis-a-vis the non-implementation of even the existing provisions of safety is debatable, but even those who stress the latter aspect agree that there are several inadequacies in the existing legislation.

Safety Regulations :

One expert who has put heavy stress on the inadequacy of present safety legislation and the need for improvement is P. R. Surendranathan, Director (Factory Advice Serivce) at the Directorate General Factory Advice Service and Labour Institute, Bombay. According to him, less that 10 per cent of the accidents can be attributed to the contravention of the provisions of the Factory Act or Rules made under the Act. "With the statutes as they are structured today it would be a folly to expect that all industrial injuries can be controlled if the managements merely comply strictly with the safety statutes."

In a recent article Surendranathan points out that the variety of industrial operations and practices which can cause injury or ill-health are so vast that all the safety measures for all types of operations and processes cannot be specified in any legislation.

A solution that he suggests is to incorporate in the statute a general clause the responsibility for ensuring the safety, health and welfare of the employees at work on the employers. "By spelling out a broad area of such responsibilities, in general terms, including that of providing the necessary information, instruction, training, and supervison, it would take care of all situations".

Surendranathan has given example of other countries, specially UK, where such legislative provisions have been introduced and have resulted in a significant reduction in accidents. Other elements of these progressive safety legislation include close involvement of the workers in implementing safety provisions, and giving them legal rights to refuse to work in dangerous situations.

Sometime back in a seminar a safety officer wanted to know what he should do if the management does not accept this recommendation for better safety. To this a member of the Directorate General of Labour Advice replied., "Now after a safety officer is appointed and if the management is not prepared to listen to him I do not think that any law can be brought in. Law has no role to play in such a matter. It will largely depend upon the practical skill of the concerned safety official as to whether he is able to keep good relations with the senior management and obtain their support".

Industrial Accidents :

Glaring neglect of safety measures is often seen to be responsible for serious industrial accidents. To support this point, here we examine the four major industrial accidents reported in 1981. On June 17 of that year 11 workers were killed when a cave-in occurred in the course of excavation work at Bokaro Steel Plant's expansion. In July at least 48 persons were killed when the premises of a silk mill collapsed in Surat. On 19th September, at a fireworks factory in Sivakasi, 32 people died. In another explosion in a fire-works factory in Gwalior, 24 lives were lost and nearly the same number were injured.

In Surat the silk processing mill which collapsed was located a bit away from the Surat Municipal Area in Majura panchayat. The first floor of this mill was sanctioned by the panchayat but later on three stories were added to this, allegedly without obtaining sanction of the panchayat. The last heavy machine weighing nearly 15 tonnes was installed on the upper floors of this mill a few months ago, allegedly against the advice of an engineer and a heavy overhead tanker was installed on the top of the structure only a few days before the collapse. What is more, unauthorised additions to the factory structure and machinery have been made in recent times in the silk processing industry of this city in several other units as well. As a newspaper correspondent pointed out after visiting this area, "A highly placed official confessed in distress that it has been the practice with quite a large number of processing units to make additions and expansion without proper sanction and then get them regularised. And the controlling officials of the factory inspectorate turn a blind eye towards this for a small consideration. Several social workers and trade union leaders allege rampant malpractices and corruption in this regard. There is a feeling among the mill owners that any ofricer could be managed".

Regarding the explosion in Sivakasi the most notable fact about this was that this explosion occurred in a factory or rather a shed which had electrical fittings while according to the law there should be no provision of electrical fittings or lighting in any part of the building where the manufacture of fire crackers takes place. Here also this was not an exceptional case; the owner of this factory as well as some others had been carrying out firework manufacturing acitivity almost throughout the night to meet the high seasonal demand and using electricity for this purpose. The factory inspectors surprisingly did not take any action against the factory owners.

There is yet another evidence of the neglect of safety measures in the high risk firecrackers manufacturing units of Sivakasi. Even a survey carried out by the Labour Bureau in Chandigarh, which glossed over several unpleasant aspects of this trade was nevertheless constrained to note, "In a few cases, particularly in smaller units, utter disregared of these safety measures was observed. Children of tender age were found inside the factory premises of these units. Even small pieces of fuses and loose crackers were scattered outside the sheds, thus exposing the workers to great risks. " This report also pointed out that processes giving considerable amount of dust such as chemical mixing and chemical filling etc. were noticed in all the fireworks units. Yet children continue to be employed in these factories and die in explosions.

The statutory conditions in the case of the fireworks industry stipulate the provision of anti-static footwear for those working in the 'mixing' section, breathing apparatus, doormat and other safeguards, but generally these are never provided to the workers. Thus it is not at all surprising that the accidents have been taking place quite regularly in the Sivakasi cracker units, although the number of dead may differ according to the circumstances in which the accidents take

place. In an accident in 1979 more that 20 workers were killed. Thus both the possibility of a major accident as well as the neglect of basic safety laws were known to the industrial safety officials in Sivakasi prior to the death of 32 persons in what was perhaps the biggest-ever accident in this industrial town.

In the case of the Bokaro disaster (according to unofficial estimate over 40 people died in this) two facts are significant. Firstly, it has been reported that just a few days before this disaster took place the Inspector of Factories had written to the General Manager (works) Bokaro Steel, drawing his attention to the hazardous conditions at the excavation site. No remedial measures were taken following these recommendations.

The explosion at the fireworks factory in Gwalior, a recent report pointed out that hazardous items whose manufacture was banned were being produced here.

Major industrial accidents caused by negligence and lack of safety measures continued in 1982. On October 19, as many as 18 people were burnt alive and 14 others received burn Injuries in the bomb like explosions in a fire cracker factory in a suburb of Ahmedabad. On November 14, nine people were burnt to death in a fire which engulfed a small plastic toy manufacturing unit in Raja Garden area in West Delhi. In the courtyard near its shed where plastic dyes and paints were scattered all over, carelessness in pumping a lighted stove resulted in the explosion. In another fire in a plastic factory in nearby Kirti Nagar one person was burnt alive and two others were seriously injured. According to a fire service spokesman the design of the building was in contravention of the rules of such factories which require that there should be at least three exits and three entrances.

Three workers died and several were injured when the 95 feet high chimney of a tile factory in Balaghat, Madhya Pradesh, collapsed. Immediately after the accident, police seized the attendance registers and 'sealed' the factory. Several workers remained buried under the debris until next morning. Workers and their families were threatened with dire consequences if any of this was revealed to the public.

As Illina Sen reported in *Frontier,* this accident was caused by glaring acts of negligence. On the day of the accident, both the Chowkidar and some of the workers reported that a large crack in the chimney was plainly visible. In any case the height of the chimney exceeded the normal by 5 feet or so. The 'Munshi' refused to close down the works for repairs but pressurised the reluctant workers to continue working. He obviously intended to complete a certain quantum of pending work before closing the factory because, contrary to usual practice, he did not allow the customary lunch break at 1 PM that day and announced that work would continue till 2.30 PM. This greed for profit was directly responsible for the tragedy which occured at 2 PM.

According to a recent report in the *Times of India* (March 20, 1984) : "The explosion in the Cochin refineries on March 8, has brought into sharp focus, the inadequacy of safety measures in the refinery, although it has been the recipient of awards for instituting safety measures with a high degree of efficiency.

"Experts are of the view that had the firefighting arrangements been made in order, the refinery fire that destroyed three tanks, damaged several buildings and claimed four lives could have been controlled faster and averted the heavy damage that has been caused. (A preliminary estimate of the damage has been put at Rs. 8 crores)".

The *Times of India* recently reported a major case of gas poisoning of workers (April 10,1984) : "More than 90 persons, including nine firemen, were rendered unconscious following a leakage in the chlorine gas pipeline at the Delhi Cloth Mill's textiles division in the Bara Hindu Rao area this morning."

According to the DCM officials, the incident took place at around 7.30 a.m. when chlorine gas started leaking from the pipeline in the bleaching section of the plant. The pungent gas soon started having its effect rendering unconscious both workers and some officers working there. Nine of the Delhi fire service personnel who reached the spot to help in the rescue operations also suffered the same fate".

Another report in the *Indian Express* (July 29, 1983) describes a case of injuries caused by boiler explosion : "Four men were injured, one of them seriously, when the boiler in the workshop of Kalsi drycleaners in the Anand Parbat industrial area exploded. The explosion ripped open the roof of the workshop and the boiler went shooting up."

According to Satish Jha, writing in *Jansatta* (March 11, 1984), in the field of electricity generation and distribution alone nearly 4,000 people die every year because of lack of protective measures, inadequate training and installation of outdated machinery etc.

A more comprehensive picture of industrial accidents includes not only the big, widely reported accidents but also, from the point of view of suffering they cause, the so-called routine accidents which injure workers, sometimes depriving them of fingers, hands or legs, and which pose an extremely serious problem, if only because of their high frequency.

A study of the accidents in engineering units employing more than 750 workers conducted by the Central Labour Institute and the Directorate General Factory Advice Service and the Labour Institute while revealing the shocking figure of 277 accidents per 1000 workers points out that 61 per cent of the accidents were due to unsafe working conditions. However a further analysis of the factors included under the head, "unsafe", revealed that 257 of the 505 cases listed related to unsafe placing, mixing, combining, handling etc.; 132 to failure to use safe attire or personal protective clothing and 98 to use of unsafe equipment. Thus it is clear that lack of proper supervision, guidance and safety equipment was mainly responsible for the unsafe acts of workers.

A study of accidents and other health hazards in the leather industry of Kanpur by Dr. R. K. Gupta points out that the highest number of injuries take place in the limbing and drenching sections. In the puering, bating and drenching sections, in pickling, depickling and degreasing also the accident rate is high. One reason for the high incidence of injuries may be that hides are soaked and the floors remain wet and slippery. In the liming sections long knives are used for scrapping flesh from skin which results in frequent cuts. In 45 per cent cases the injuries were cuts.

Another industry where safety conditions cause concern is the Chemical Industry and within it specially the units manufacturing insecticides. A four man inquiry committee which looked into the working conditions of the Hindustan Insecticides Factory in Delhi some years back pointed out "Almost every worker examined had a gassing incident which necessitated treatment and in majority (of cases) inhalation of pure oxygen". This Committee felt that improper opening of valves, very frequent leaks and lack of precautions caused escape of toxic chemicals. Another more extensive study of workers involved in pesticides formulations carried out by the National Institute of Occupational Health during 1978-79 says, "The toxicity symptoms such as headache, vomitting, nausea, stomach ache, skin and eye irritation and respiratory complaints manifested either singly or in combination in majority (73 per cent) of exposed subjects."

A recent review of the industrial accidents expressed its concern over the fact that although ISI standards lay down some rules for inbuilt safety in machinery, this is only for selective machinery and the standards are hardly high. It also pointed out that there are barely 60 odd small and medium-size factories in the country manufacturing safety equipment. The quality is poor and there is hardly any research in the sphere of safety equipment and materials.

It is seldom that major accidents are reported from the leather industry, the engineering units or the insecticides factories. Yet as the above accounts reveal a large number of workers are injured, gassed or die in these industrial units, in the course of thousands of small accidents none of which individually attract any attention but almost each one of which spells misery and distress for an impoverished worker's family.

Raghab Bandopadhyay, in *The Business Standard*, described the safety conditions in a West Bengal factory which has been recently taken over by the government. He quotes a worker who says that there are 8 to 10 small accidents there every day.

"The factory has more than 20 lathes and drills which are more than 25 years old. Machine guards virtually do not exist. The electrical system is in a dangerous state; the wiring switches are so old that the chances of a short circuit must be pretty near a hundred per cent... Workers who work with acids are denied filter masks; each day they inhale a dangerous amount of noxious fumes; besides acid exposures, we all know can cause a large number of diseases from skin disorders to cancer. In fact, this particular factory is a breeding ground for virtually every kind of physical, chemical mechanical and psychological occupational hazards. And yet, the office room of the factory is so well appointed that

it could pass for the PRO's office of any multi-national company... Of the 789 workers, practically no one wears safety boots. Despite several accidents, they carry on with the work of welding or handling large iron beams without even this minimal precaution. The workers themselves are apathetic about safety, because the company does provide them with boots and uniform. But there were also complaints that the safety boots were of bad quality, wrong size and uncomfortable.

Compensation :

Compensation payments are given to victims of industrial accidents on the basis of the extent of disability suffered by them. Dr. A. J. Thakur, ortho-paedic surgeon at the Cooper Hospital, Bombay, says, "The disability charts consider only occupation disability, and for this, only the 'loss of part' is considered and compensated; the charts mainly mention this loss in terms of the length of a part of the body. There is no mention of the biological effects of the injury, nor of the loss of quality of function. The emotional components of the injury are never compensated. Thus the charts are merely attempts to quantify what are essentially qualitative concepts. At best, the charts are arbitrary."

It has been reported that the government is planning 'sweeping changes' in the present system of compensation for workers in case of death or permanent disability. But will these changes be to the benefit of the ordinary workers? No, the same news-report informs us "in the new scheme however, low salaried groups stand to lose substantially. Not only is there no hike in the existing rate of compensation but workers with less than Rs. 200/- per month also suffer from a decline in the prevailing flat rate."

Compensation payments are often delayed, and the workers family suffers for a long time. Often fiting legal cases to claim compensation proves to be beyond the capacity of poor workers.

A recent report of the Gwalior fireworks accident (which occurred on 3rd Dec. 1981) pointed out that none of the victims' family received any compensation till May, 1982. In the recent Bokaro tragedy although most of the workers belonged to extremely poor tribal families, there were several problems in paying adequate compensation to them. This happened partly due to the confusion over the status of employers as the Hindustan Steel Works Corporation Ltd. had first entrusted the work to one construction company and then to another. Another problem was that there did not appear to be adequate legal safeguards for the workers employed in the expansion of an industry, and not the industry itself.

In the existing industrial scene in India where very low value is accorded to the working conditions of labourers by the industrialists and also given their ability to secure the collusion of labour officials and the backing of politicians even the dedicated efforts made by some individuals and organisations towards a fair compensation may be frustrated.

II MINING AND QUARRY ACCIDENTS

A cursory look at the statistics of mining accidents (Table 4) reveals that the injuries caused by them are much less compared to industral accidents but on closer examination the deceptiveness of this view becomes apparent. Injuries in the mining sector have been officially classified into 'fatal' 'serious' and 'minor' injuries. A 'serious' injury is taken as one which involves permanent loss or injury to sight, hearing or fracture of any limb or the enforced absence of the injured person from work for a period exceeding 20 days.

According to the Labour Bureau, "At present a fair proportion of minor injuries is reported to the Director General of Mines Safety only from coal mines, but a small proportion from other mines. It is considered that minor injuries are incompletely reported and hence statistics of fatal and serious injuries only are presented."

Hence the data for the mining sector for non-fatal injuries are not at all comparable with the data for factories, as even the officially available data for 'minor injuries' is excluded from the former.

In 1979 there were 2,853 serious injuries in mines. Out of these 2,122 were reported from coal mines. In view of the safety conditions that are known to exist in several mines, it is difficult to believe that there were only 731 serious injuries in all the other 'non-coal' mines. More specifically it is difficult to believe that there were only 82 serious injuries in the various iron ore mines, only 126 injuries in the extensive limestone mines, only 7 injuries in the mica mines and most incredibly, only 9 injuries in the stone mines.

A large number of accidents that occur in the mines and quarries which are operated or controlled by private owners are never reported. This is even more true of the illegally operated mines, specially of coal. Recently attention has been drawn to the accidents in illegal mines in the context of the disaster at the 'illegal' Bhadua coal mines in Giridih district in Bihar on February 13, 1981. In August, 1980, three persons were killed while working in the same Bhadua mines. At the time of the Bhadua disaster, news reports quoted Mr. Chaplendu Bhattacharya, a former MP and trade unionist, as saying, "I am aggrieved to see over 100 labourers dying every year in illegal mining operations.....All have combined to cover up the crime."

According to one estimate more than 10,000 people in Giridih district are employed in illegal mining. About 2,700 people work for the Central Coalfields Limited. Officially, of course, it has been stated that no one died in the Bhadua disaster and as proof of this it is said that no one has come forward to report his family members missing or to claim compensation.

How can the right number of dead persons be known when those who make lakhs of rupees by illegal mining send their goondas to terrorise the villagers not to disclose names of any 'missing' persons? This is precisely what happened in villages around Bhadua soon after the disaster in 1983. If despite this family members of a minor who had died in this disaster approached the authorities with a compensation, far from getting any compensation they could have been harrassed on charges of illegal mining. It is hardly sursprising that those who die in illegal mining remain unknown.

Official statistics on the causes of coal mines accidents are available (see table 5) but these do not give an idea of the extent to which the neglect of safety measures is responsible for the disasters in mines.

The explosion in the Chinkauri colliery in the Raniganj coal fields was caused by the illegal activity of firing explosives in the presence of methane and the abundant presence of untreated coal dust which contributed to spreading the explosions all over the mine. This disaster could have been averted if the ventilation system in this mine had not been neglected during a 4 days closure.

The Kosurgarh Colliery disaster could have been prevented if systematic timbering rules had been fully carried out at the site of the accident.

TABLE-4

OCCUPATIONAL INJURIES IN MINES 1961-75

	NUMBER OF PERSONS	
Year	Killed	Seriously Injured
1961	344	5,173
1962	368	4,945
1963	344	4,110
1964	287	3.371
1965	547	3,298
1966	319	3,210
1967	293	2,837
1968	337	2,708
1969	321	2,603
1970	279	2,425
1971	304	2,346
1972	287	2,329
1973	320	2,694
1974	306	2,919
1975	734	2,879

In Chasnala mines the way in which a massive World Bank loan was obtained for developing new mines, neglecting the potential of old workings, has exposed the concerned officials to a lot of criticism, but what was really inexcusable was the way in which the work at the new mine was handled. Expert advice regarding the dewatering of old workings and leaving a substantial barrier was blantantly ignored. At least 431 miners perished in Chasnala.

In the Nirsha colliery explosion on March 14, 1981, leaving 10 dead and 28 injured, it has been alleged that the explosion occurred because of the violation of the provision of the Indian Explosives and Mines Act by the Colliery management. Nearly half a tonne of high explosives, comprising electric detonators, were stored in the lamp room, although the colliery does not possess any explosives licence and did not

(Contd. on page 11)

Table - 5

ACCIDENTS IN MINES BY CAUSES, 1972-75

CAUSE	FATAL ACCIDENTS			SERIOUS ACCIDENTS	
	No. of accidents	No. of persons killed	No. of persons seriously injured	No. of accidents	No. of persons seriously injured
1. Falls of roof	105	135	31	183	201
2. Fall of side (walls)	35	38	11	168	176
3. Fall of side (face)	16	17	1	30	33
4. Other ground movement	3	3	-	19	23
5. Transportation Machinery (winding in Shaft)	10	10	10	12	13
6. Transportation Machinery (other than winding in shaft)					
1. Rope haulage	26	26	2	414	419
2. Other Transportation Machinery.	20	20	1	254	255
7. Machinery other than Transportation Machinery	6	6	-	135	136
8. Explosives	11	12	10	44	55
9. Electricity	4	4	-	13	14
10. Dust, Gas & other Combustable materials	3	8	2	—	—
11. Falls (other than fall of ground)					
1. Fall of person	17	20	1	410	411
2. Fall of object	6	6	—	600	601
3. Other falls	—	—	—	7	7
12. Other causes					
i. Irruption of water	—	—	—	2	4
ii. Flying pieces	—	—	—	78	78
iii. Extremity caught in between object	—	—	—	212	212
iv. Miscellaneous, Including Unclassified	1	1	—	212	212
Total	263	306	69	2,793	2,850

(Contd. from page 9)

have a magazine house to store such explosives. After the explosion officials found nearly 4000 unexploded detonators strewn around the area.

Another factor which has enhanced the risk of mininig accidents in recent years, are the frequent power failures. On January 4, 1979, a major accident took place in the Bargolia coal fields of tne Upper Assam district of Dibrugarh. 16 miners were killed and over 50 had to be hospitalised. While various reasons have been advanced for the fire and explosion which devasted this mine, attention has also been drawn to the contribution of power failure. To prevent methane gas to accumulate to a dangerous level, exhaust fans and ventilation should function properly. On the morning of the accident, there had been two power failures and the ventilation system had been disrupted.

19 Miners perished in the disaster which struck Bharat Coking Coal Ltd's Harraladih colliery on 14th September, 1983. According to a report in *'Sunday'* by Ajai Mishra "That the BCCL officials have little regard for the safety measures stipulated by the Director General of Mines Safety (DGMS), and that the mines maps are yet to be undated even ten years after the nationalisation of coal mines, was very evident at the Hurraladih mine mishap.....Union leaders and colliery workers have blamed the management for the tragedy, Mr B.P. Singh, an overman of the ill-fated mine told this correspondent that miners had refused to work in the mine, because they knew it was unsafe when they found that water had accumulated at the top bottom of their working face. But colliery management instead of dewatering the heavy accumulation, opted otherwise. Mr. Singh, who had raised this issue was silenced by the management with a threat of dismissal."

These are only some examples of major accidents. In fact in most cases the neglect of precautions cannot be brought out, or at least not exposed fully, because of attempts to cover up the failure of the authorities in adopting adequate precautionary measures. This is clearly brought out in the Kesurgarh Colliery Disaster Report. "A responsible organisation like the Bharat Coking Coal Ltd. should have placed all the facts as come to their notice before the court and it was expected of an organisation of this stature to point out that there had been a human failure at a certain level and they had taken action against those responsible for this failure. Indeed this fact was not mentioned by anyone of the witnesses produced by the management." Further the Report noted, "The delay in informing Directorate General of Mines Safety (DGMS) had led to the suspicision that it was either motivated or even if not motivated, was taken advantage of by the colliery officers to make such changes as would give a better impression to the officers of the DGMS. There are indeed some indications that there was deliberate tampering with the site in order to make a favourable impression on the DGMS in regard to the adquate observance of the timbering rules....."

That the glaring acts of negligence and subsequent cover up operations continue unabated is apparent from the recent mining accidents in Hazaribagh mine area. First on July 16, 1982 at Topa Colliery of Central Coalfields 17 miners were killed by a roof fall measuring 10 meters by by 0. 5 metres. Soon after this two miners were killed in an accident at Sarubera. In yet another accident at Sonda, one miner was killed. As a minig expert K. V. Subrahmanyam has pointed out, "the fact that a slab of roof measuring 10 metres by 25 metres by 0. 5 metres had fallen makes it clear that such a large area in a depillaring district was unsupported or was so unsatisfactorily supported as to result in the collapse of the support... Obviously the supervisory staff inspected the area immediately after blasting and had the place secured by an adequacy of support".

Similar y regarding the accident at Sarubera it has been pointed out that when the work here was started, the height and width of the galleries were well within the regulation limits. But anxious to step up production, the manager ordered both width and height to be increased, and that too without any systematic support. "The height which should not exceed 10 feet was increased to 20 feet and more. Supports have to be put up at intervals of at least 1.2 metres but there but there were hardly any supports".

And soon after the accident, "the management began their cover up operation.. All timber gangs were detailed to this; incline and supports were quickly put up. Stoppings were made to hide the area where the gallery height exceeded 10 feet."

In the case of the Topa disaster when the Coal India Chairman tried to put the blame of the disaster on

workers, he was mobbed by angry workers shouting "You are telling lies". According to a news report, quoting local persons in the immediately preceding two shifts, miners had been asked to go to the mining points of disaster, but had refused, smelling danger. And so nine recruits, along with others, were asked to go there".

According to *Indian Express* (December 27,1983) The Pandey Court of Inquiry into the Topa colliery accident in Hazaribagh district of Bihar on July 16 1982 "the conclusion could not be avoided that the mine suffered from lack of effective overall supervision at the time of the accident. Supervision was wanting at two successive levels, and was ineffective at third successive six level."

"The report said that the 'consensus of evidence' was that the mining sirdar asked the miners and loaders to go into the goaf (undermine) and collect the scattered coal for loading. The miners and loaders protested and some of them said they would not work in a goaf from which all supporters had been withdrawn."

"The mining sirdar warned some of them that they would not get their fall-back wages. He told others that if they would not work there, they would be sent out of the mine. Then the mining sirdar himself went into the goaf and stood there saying that if the roof had not fallen so far, it would not fall in 15 minutes or so which would be required for collecting the coal lying scattered in the goaf."

"Thereupon some of the miners and loaders went into the goaf and started collecting coal. Seeing this, others too followed. They had hardly worked for about 10 minutes when the roof of the goaf suddenly fell upon them."

Recently the associations of mining officers have also drawn attention to the neglect of safety aspects in mining. The *Economic Times* reported on September 23,1983.

"Most of the three hundred odd underground mines of the Coal India Ltd. are danger-prone and safety norms are being violated despite repeated warnings given to CIL management by the engineers."

"Mr. M. Qaseem, general Secretary of the 11,000 strong Coal Mine Officers' Association of India, (CMOAI) said that CIL management in consultation with the Union Energy Ministry would have to take immediate measures for surveying these mines, or ensuring fool-proof safety measures.

"Last year, CMOAI submitted a memorandum to the Centre indicating that some mines were danger-prone, and safety measures would have to be taken but he regretted that not much headway had been made in this direction.

"Mr. Qaseem demanded that a comprehensive programme would have to be taken up for replacing old equipment and survey of the machines. He admitted that the violation of the safety norms had led to many accidents at the coal mines and it had become imperative now for the Centre and CIL management to give priority for mines safety.

"The rescue stations had been suffering from lack of apparatus and machinery was not being maintained. Besides, the mines were being operated on all days, as a result of which no scope was there for giving adequate attention to the maintenance of equipment. He wanted that there should be no work for at least one day in a week in the mines.

"Sudden power breakdown had been threatening the safety of the workers as well as of the equipment and it would be better if the working days were staggered and power supply apportioned leading to least damage to the mines."

While on the one hand there were attempts at cover up, on the other hand concrete steps to improve mines-safety such as frequent and proper inspections or providing adequate staff for safety measures have been getting decreasing attention. It was officially admitted that there has been a steep decline in the number of safety inspections carried out in the mines. Deposing before the Sarin Commission which inquired, the Director of Mines Safety (Central Range) S.P. Ganguly said that under his range there were seven gassy mines and during the last three years the number of officers had been reduced by 25 to 30 percent.

In a Rajya Sabha debate some time back on coal mines accidents, an M.P. Mr. Kalyan Roy cited several instances of officials held responsible for accidents being promoted instead of being suspended. When the Union Minister of Energy and Coal insisted that guilty officials are to be punished,

another member asked if promotion and punishment are synonymous. In a particularly glaring case an official of the DGMS who was involved in preparing a farcical report on the Chinkauri Colliery explosion (1958) was rewarded by promotion to the post of Director General of Mines Safety.

Evidently from the examples cited above that behind most accidents, including some of the extremely destructive ones, there has been a glaring neglect of safety precautions. However, it is important to further probe this neglect and ask why is it that such shocking cases of neglect are repeated so often. And if we try to seek an answer to this question an accusing finger is pointed invariably towards the deplorable working conditions in our mines. The rule of mafia and thinly-disguised goondas and the hold of powerful contractors and illegal mining-kings implies that much of the mining work instead of being carried out according to proper technical specifications is done in an arbitrary manner. In the case of Chasnala, the technical factors have often been pointed out, but if one probes further and asks why the specification regarding leaving a barrier was ignored, the most probable answer is that survey work had not been done properly, and the existing maps did not give a correct picture of the actual gap between the two mines. In view of the importance of this work, this could have happened only under an arbitrary and disorganised set-up. In fact, according to inside sources, most of the major accidents (incidently some of the worst among them took place during the 'law and order' months of the Emergency) have taken place in the mines which are notorious for their domination by antisocial elements. According to Coal Mines' Officers' Association there are 99 "unsafe" coal mines in the country where mining without ensuring safety measures can spell disaster. A CMOAI spokesman said of the 99, one belonged to North Eastern Coalfields, 44 to Eastern Coal fields, 25 to Bharat Coking Coal, 14 to Central Coalfields, 13 to Western Coalfields and 2 to the Indian Iron and Steel Company Ltd.

Although public attention has been drawn to mining accidents mainly in the contexet of coal mines and largescale tragedies in fuel-mines like the one which took place in Chasnala, highly hazardous conditions exist in the other mines as well.

As far as the incidence of serious injuries is concerned it is the highest in the copper (16.5 per thousand) and gold (13.9) mines.

An official publication says about the hazards in gold mines, "the unusually varied and complex nature of the rocks in the Kolar Gold Fields and the great depths at which mining work was being carried on had in combination with each other, given rise to the hazards known as rock-bursts. The pressure developed by the rocks adjoining the work spots gets ifself escalated as a result of a series of chain reactions and culminates into a rupture resulting in earthquakes of mild intensity. The occurrences are known as rock-bursts and the heavy toll of human lives that these rocks-bursts had claimed in the past indicates the disastrous consequences of this natural phenomenon."

In the iron ore mines at Dalli Rajhara (which are captive to the Bhilai Steel Plant) I learnt in the course of a recent visit that while big disasters have not occurred, a large number of injuries are nevertheless caused by frequent small accidents. In fact a senior official of DGMS who visited this mine is said to have expressed his concern at the hazardous working conditions in these mines. While in the mines it is the risk of roof and wall collapse which poses the biggest hazards, the transport of ore by trucks driven at high speed to maximise the profits of the transporters also leads to large number of accidents here.

The official statistics on mining accidents are gathered to a large extent from coal mines and some other mines in the organised sector while the victims of accidents in mining and specially quarrying work in the organised sector are by large ignored. Unlike in the organised sector, these victims generally also do not receive any worthwhile compensation for the injury to their bodies or the death of their family member.

Although the official statistics tend to conceal this problem rather than reveal its intensity, there is growing evidence that the incidence of accidents among the quarry workers is extremely high. For instance, the quarries located near Delhi. Thousands of workers, most of whom are migrants, toil in the quarries of stone and bajri in and around South Delhi-in Badarpur, Faridabad, Mehrauli, Lal Kuan, Fatehpur Beri etc. According to Mr. Inder Mohan, General Secretary of the People's Union for Civil

Liberties, almost every week an accident occurs in these mines, but the news of this is generally suppressed by the contractors. Recently disclosed figures relating to the South Delhi sand and stone mines of Bhatti and nearby areas reveal that nearly 45 workers — men, women and children, lost their lives here since 1977 as a result of lack of minimum safety. During the same period, 150 suffered grievous injuries, like loss of limbs and eyesight, in mine blasts and cave-ins.

Despite the efforts of the contractors to hushup such cases, the news of one fatar accident after another has been filtering out during the recent months due to some social workers who have been trying to organise the workers and make their voice heard.

On February 17, 1983 three labourers were killed and one seriously injured in the mine collapse accident at the Bhatti mines. On January 24, 1984 four labourers, including a seven year old boy, were killed and at least two others were injured when they were buried under an avalanche of sand following the collapse of a section of a wall of a mine in Fatehpur Beri. Only a week earlier, on January 16 Bharpai died at the Bhatti Bajri mines when a heap of bajri fell on her and her husband too was seriously injured. On January 10, another miner Mashaq Ali died in similar accident. Thus during the month of January alone three fatal accidents were reported from these quarries. In addition, on January 4 seven huts of workers were destroyed in a fire. In another serious accident 4 men Hansa, Parbati, Kanna and Sonu were buried alive at the Bhatti Badarpur mines in Delhi when an overhanging rock-shelf collapsed over them.

Recent closure of work at these mines was followed by even more risky quarries in Pali. In fact with the rising mounds of loose soil piling up overhead miners in this area are now exposed to greater hazards than ever before. These rising hillocks are the main cause of cavein accidents that occur all too frequently causing most of the deaths and injuries, but the Delhi State Industrial Development Corporation (DSIDC) which is responsible for safety administration in the mines has not been able to clear them to tolerable limits.

Several of these mines where the work is being carried out and where workers have been dying at regular intervals were declared unsafe by the Directorate General of Mines Safety but the considerations of high profits from the nearby lucrative market of Delhi have led to the continued operations of these mines. This situation is made worse by the callous attitude of the contractors towards safety evidenced in the dynamiting techniques they employ and in their obstinate refusal to provide even elementary safety equipment to the workers.

While the Delhi administration has been quick to put the entire blame on contractors, it should be added that they would not have been able to continue their lucrative trade for such a long time in violation of the various laws but for the collusion of corrupt officials in "the nefarious nexus between the exploiter-employer and a conniving administration", as Swami Agnivesh puts its.

The situation is not very different in the Paakur hills of Santhal Parganas district, Bihar. This is one of the biggest stone quarries in the country, where the workers, most of them tribals, work like bonded labour. According to a recent report, every year dozens of labourers, rendered helpless by the accidents at these quarries, are forced to turn to the streets as beggars. A heavy toll is taken by blasting operations, where due to the neglect of safety provisions, the explosions occur too early and the workers do not have enough time to run a safe distance.

Similar neglect of safety measures is seen at several quarrying sites in Western Himalayas. In the hills around Mussorie, known for their rich limestone deposits, now families of most of the workers who die or are injured in the course of their work can get compensated but till some years back the bodies of several of these unfortunate victims used to be disposed off quietly by the contractors. Apart from the miners, the drivers who carried the limestone from the mining site in old, dangerous vehicles called 'gattus' also suffered a very high rate of accidents. Recently in one of the most tragic accidents in one of these quarries, at least six persons were buried alive and 12 were injured at a state quarry in Nitinala, on Mandi-Kulu road, Himachal Pradesh. The accident occurred when a portion of the quarry caved in during the excavation operations on January 20, 1984. Seventy five workers were employed in this quarry when the mishap occurred.

According to a report by Farzand Ahmed (*India Today*, August 31, 1983) in the mines of Singhbhum district of Bihar: Working conditions are

scandalous; miners get no boots, no helmets, not even a mask compulsory under mines safety rules. "We inhale a lot of dust, risk our lives and when we go back we are forced to drink dirty water. We don't know if we are dead or alive," sums up Martin, 50, a miner for the last 30 years.....At Megahataburu mine, run by the Bokaro Steel Plant here the work of constructing the mines has been entrusted to private contractors—37, according to one estimate — who have employed around 4000 workers. Social activists in the area found that no worker was getting the statutory minimum wage; injured workers and workers killed on the job were not getting compensation, there was no rest shed and no housing.....The team also detailed a number of accident cases where compensation was denied. Examples :

Daso Risum, me ployed by Bedi Construction Company, lost his right arm on the job. He did not get any compensation or salary for the period he stayed in hospital. **Bagun Largiri** was buried under earth and his spinal cord was broken; he was never seen at the mines again; **Jasman Horo** lost the sight of his left eye when a stone struck it. He received Rs. 11 as compensation and no other aid.

"Several workers complained that they were made to work when they were medically unfit; Krishna Ban Singh was dismissed for merely demanding treatment. Women in advanced stages of pregnancy were summarily dismissed, without benefit of maternity leave or checkups; among such were Sukurmoni Bodru and Sombari Sundi. In such a situation, they preferred to cotinue working like Rammuni Purty, who later delivered a baby with the help of one of the activists, Dr. Anne. Moni was not so lucky, the baby did not survive. A number of sick and injured have died but "there is no record as tribals go back to their villages before they die."

A report in *Jansatta* (May 20,1984) describes the tragic working conditions of about 100 families working in black-stone quarries of Kati Ghati in Gwalior district. One member in almost each family has been seriously injured in the course of working here. None has received compensation.

According to another report in *Probe* magazine (June, 1983) : A long and bleak and rocky stretch of the Vindhyas traversing the border of Jabalpur and Satna district in north eastern Madhya Pradesh where some 30,000 lime kiln and limestone quarry workers are being relentlessly driven to death. A compelling urge for survival enslaves them... And as they wage a grim battle for survival a deathly curse casts its spell on them: work in the kilns and quarries necessitates inhaling dust and smoke in vast amounts and with terrible consequences... Few workers in and around Katni - the lime and limestone industry centre have worked for more that eight to ten years without falling victim to tuberculosis or a disease far worse and for which there is no cure, silicosis. When they leave enfeebled and spent, a new lot gladly takes up their jobs, for, in this chronically drought-stricken region, it is only the lime and lime-stone industry that provids some sort of steady employment. And so the cycle of savage exploitation repeats itself, as it has been doing for the last 135 years, ever since the industry came into being... The human wrecks, the half-starved and half-clad workers whose last drops of sweat are being wrung out by exploiters can be seen everywhere, at any of the 150 kilns or 100 mines and quarries along the 40 km. belt from Katni to Kymore."

In case of injury and disease, proper medicare facilities are seldom available to the workers. In the absence of prompt medical care, often even relatively small injury can lead to permanent disablement of a worker over a long period of time, with no chance of getting a compensation payment.

Recently several widely publicised (though not quite effective) steps have been taken to reduce accidents in the mines of the organised sector. Official statements stressing the importance of safety are made, unsafe mines are being identified and safety awards are being given. But all these efforts appear to be oblivious of the plight of these highly low-paid labourers leading to an extremely precarious existence in thousands of quarries scattered all over the country. This is a badly neglected area crying out for the care of those in charge of implementing safety measures in our mines.

III. ACCIDENTS AT CONSTRUCTION SITES

It has been recently announced that a comprehensive legislation to promote the health and safety of 22 lakh construction workers is likely to be introduced soon in parliament. The proposed legislation will cover building and construction workers employed in roads, dams, irrigation projects, thermal stations etc. and will provide for various types of health and safety measures for specific operations which expose the workers to various hazards. This legislation was long overdue, as is clear from the frequent cases of death and injury of construction workers that are reported in the press. Probably a much larger number of cases go unreported.

On March, 27, 1981, eight labourers were killed and seven injured when a girder fell on them in Banswara district of Rajasthan.

On December 8, 1981, 15 persons were killed and 13 others seriously injured when a godown under construction collapsed in the Dudhi Tehsil of Mirzapur district, UP.

On February 5, 1983, about 12 labourers were feared to have been buried alive and 8 others injured when a ten metre link road bridge under construction in Himmatnagar collapsed.

On March 10, 1984 two migrant labourers from UP perished while digging a ditch for sewer lines in Govind Puri, New Delhi. The workers alleged that the contractor who was carrying out this work for DDA kept them as bonded labourers and forced them to do hazardous work, ignoring precuationary measures.

According to the *Times of India* (February 1,1984) at least five labourers were killed and 14 injured, five of them seriously, when the steel tubular scaffolding of a multi-storeyed building under construction on the Tolstoy Marg, Janpath Junction, in New Delhi collapsed.

"The tragedy occurred around 7.30 p.m. when 15 to 20 labourers were busy arranging and erecting the steel tubular scaffolding at the site where the Rs. 16 crore building of the State Trading Corporation is coming up.

"All of a sudden, the balance of the scaffolding was upset and the entire 16.5 metre high structure came crashing down with a loud bang.

"Chanda Shah, a labourer who had a miraculous escape, said the workers were pushing the scaffolding to correct its alignment when the whole tubular structure came crashing down along with over 20 labourers who were working on it."

With the heavy accent on constructing skyscrapers the hazards faced by construction workers, who have to climb great heights with big loads, have increased manifold. Another factor is the increasing use of substandard materials. While in the long run the hazards of this are faced by the owners of these buildings, sometimes on the jobs workers themselves become the victims of this substandard work specially during 'monsoon' and storms.

Recently there have been several cases of under-construction houses collapsing in Delhi in the upcoming DDA colonies and several construction workers have been injured as a result.

Another factor responsible for a large number of accidents is the pressure of completing the work in time. Often the workers are forced to work beyond their working capacity by contractors and officials anxious to complete the project, which might have been delayed due to several factors, on time. An exhausted worker obviously cannot be careful about his work a good part of which involves several hazards. This results in several avoidable accidents. Pressure of time also leads to the neglect of several precautionary measures.

This factor was particularly important in the context of a large number of accidents reported from the various project sites of Asian Games. As is well known, the pressure of time in these projects was acute.

On December 9, 1981 about 19 workers were injured (official version) when a huge chunk of the flyover under construction near Seva Nagar for the Games collapsed. According to local residents who helped in the recsue work the number of the injured workers was much higher. They pointed out that the shuttering which was being used was too narrow to take the weight of the massive overbridge.

On July 6, 1982 six workers were seriously injured in another case of collapse at the Jail Road flyover. Five workers received burn injuries at a fire at the I.P. Stadium. Apart from the known and officially

acknowledged 'accidents' there were many others which were hushed up.

According to Inder Mohan, well known social worker and Delhi PUCL Secretary, "I have personally recorded 65 cases ot death at three stadium and seven five-star hotel-sites. The source of information was their fellow workers and nearby pan-bidi and tea vendors. Workers have been carrying loads to considerable heights up rickety scaffolding.....Injuries caused while at work or deaths due to accidents are sought to be treated as top secret by the authorities. This is because of the total absence of safety measures as provided by law. Secondly, by hushing up these accidents payment of compensation can be avoided."

A report prepared by PUCL, Delhi, also depicts the tragic plight of the victims of disease and accidents among the ASIAD workers and the glaring inadequacy of the medical facilities. According to this report these workers were left to their own fate by the contractors and officials.

The three ombudsmen appointed by the Supreme Court on May, 1982 for protecting the interests of the workers at the different ASIAD construction sites also said in one of their reports that there had been serveral accidents, some of them fatal, at the Indraprastha indoor stadium which have been suppressed by the DDA officials and the contractors. In their report, (released in August 1982,) they also stated that during the last 18 months at least 100 serious accidents cases had been treated at the Jeevan Nursing Home alone. Besides, those who sustained injuries in accidents were forced to return to their villages after their discharge from the hospital; whether they were paid any compensation could not be verified.

The living conditions of the construction workers, most of whom lived near the work sites in mud shelters, cannot be isolated from the accidents at work places. Often the living conditions are characterised by lack of clean drinking-water, water logging in rainy season, poor quality of food, and total lack of hygiene. This naturally leads to a host of diseases. Given their extreme poverty and the pressure of work several of them are forced to work even when suffering from fever and weakened by disease. This exposes them all the more to work-place accidents.

The workers forced by their poverty to increase their earnings, and the contractors anxious to employ low cost labour — this situation often leads to the employment of children in the hazardous construction work. The Supreme Court has recently given strict instructions that the employment of children in hazardous construction work should be strictly curbed. Workers employed at dam sites are among those construction workers who face high job site risks.

Nine labourers including three women, were buried alive when a huge mound of earth caved in at the dam site of Kanjahari medium irrigation project in Keonjhar district, in Orissa on 26th January. The accidents occured around noon when about 80 workers were engaged in filling up a trench at the dam-site with sand.

Ramganga dam in the Kalagadh area of Uttar Pradesh has attracted widespread attention as an engineering achievement, but the high price paid by hundreds of labourers and technicians to take this achievement possible has received scant attention.

It is well known that in the case of huge projects like the Ramganga dam, it is difficult to get reliable estimate of the workers who die or specially those who are injured at the work site. Generally only those who suffer injuries of a permanent nature are listed in the official record, and that too not always. According to a 'probably incomplete' list of workers who died at the Ramganga dam workrsite, published by a local newspaper *Bijnore Times'*, 88 workers perished at the altar of this dam. In addition as many as 501 workers were injured, many of them rendered physically handicapped for the rest of their lives.

Work at dam invlvoes operation of heavy machinery as well as manual work on steep slopes, in tunnels and in other hazardous conditions. Most of the work is done in remote areas, and a large number of workforce, specially at the lowest levels consisting of migrants from far away areas who have no means of making their voice heard. In these conditions it is not dlfficult to quietly dispose off the dead bodies, sometimes just throw them into the river, and not even pay the compensation payment.

Sometime back Orissa's Minister of State for Labour Mr. J. K. Patnaik, who also heads a committee of the Orissa Assembly on migrant labour, said after visiting the Salal dam site in Jammu and Kashmir that those migrant labourers of Orissa employed there who resisted oppression were being thrown into the Chenab river. When the committee members

visited the dam site, 16 Oriya labourers virtually fell at their feet, imploring them to rescue them from the torture there. Instead of any effective action being taken to protect these workers Mr. Patnaik himself at a later stage withdrew some of these statements soon after his return from the dam site.

It was revealed in the findings of this Committee that these workers were unable to communicate with persons other than their employer and supervisor. When the work for the dam was over they were herded into ramshackle huts and locked from the outside.

The conditions are nearly the same at the Tehri dam worksite in Uttar Pradesh (Himalayas) where the migrant labourers from Bihar, Madhya Pradesh, Orissa, Tamil Nadu and Maharashtra are employed. Several of these workers, while remembering the name of their village hardly know anything about its location and probably will not be able to escape from there.

It is well known that the construction of Tehri dam has run into several technical problems and some of these have posed grave hazards for workers. Working in tunnels at landslide-prone sites are some of these hazards.

Recently 10 workers were employed at constructing a colony for Tehri dam workers. This area had been experiencing a heavy snowfall and was in the grip of a severe cold wave. But these workers had hardly anything with which to warm their bodies, and make their beds. Finally on the morning of December 28, 1982, 3 labourers were buried under snow and sand. The remaining labourers managed to run away to safety. All the three labourers, Parmeshwar Ram, Kodai Ram and Baldev Ram, were from west Champaran, Bihar, Beriya and Jogapath police stations.

Meelu Purti's leg was broken when a stone fell on him in the tunnel excavation work. His leg has now been put in plaster, and he has also asked his mother living in a remote village of Singhbhum district, to come and look after him. The contractor gives him 5 kgs of rice and Rs. 20/- every week on which two of them cannot subsist. In the severe winter of the Himalayas this cannot even cover their bodies adequately not to talk of getting medical treatment.

Prahlad Walanchoo from Mayurbhanj district of Orissa has continued to go to work despite his hand having been injured. He has hardly any choice, he says, for if he does not go to work he will die of hunger. At night he sleeps on a sack and covers his body with his lungi.

What happens when a worker dies at work place? To this a labourer from Aasansol replied sarcastically that the company is kind enough to provide wood for burning the body.

While the enaction of legislation in this field is welcome it should also be pointed out that in recent years several construction companies and contractors have been importing their labour force from remote areas and keeping strict surveillance over them so that it becomes very difficult for social activists and those interested in their welfare to gather any information about them. This secrecy about the working and living conditions of the labourers help to perpetuate their exploitation and it is necessary that the proposed legislation should also have some clause which makes it easier for the social workers to gather facts about the living and working conditions of these labourers as a first step towards improving them and securing the implementation of the existing laws.

IV. ACCIDENTS IN RURAL AREAS

The problems of occupational health have been generally discussed in the context of industry and to a lesser extent mining. However, with the advent of machines and poisonous chemicals in a big way on the agricultural scene, it is important that the health hazards faced by farmers and farm workers should also receive the attention of those monitoring the occupational health problems in the country and striving to reduce them. Specially in a predominantly agricultural country like India, the importance of this cannot be over-emphasised.

The victims of machines and chemicals are the more obvious symbols of the occupational health issues in agriculture but even within the frame-work of traditional technology such problems no doubt exist. For example the labourers who are forced to work unduly long in extreme heat suffers a sunstroke. Or

the more long-term health problems of labourers who are made to toil hard on low wages leading to under-nutrition which in turn make him susceptible to several diseases. Such a broad definition of occupational health, however, may not be of much practical utility in the existing conditions of rural Idian.

From a practical point of view it is easier to identify the more specific victims of occupational hazards, the farm-hand who was injured when a tractor over-turned or the labourer whose hand was mutilated while crushing sugarcane. With farming of cash-crops being undertaken more and more like any other industrial activity and with farmers making full use of the availability of cheap labour to reap big profits despite the high costs of inputs, there is no reason why farm workers should not be entitled to the protection to which most of the industrial workers, on paper at least, are entitled. After all in which way is the plight of a farm labourer whose hand has been chopped off in a thresher different from that of an industrial worker, although at present the former is unlikely to get any compensation, while the latter is likely to get a relatively satisfactory compensation.

While several occupational health hazards of farm workers can be counted, the two most important appear to be those arising out of the rapidly increasing use of mechanised threshers and chemical pesticides.

Mechanised Threshers

It has been officially estimated that every year during the three months long wheat harvesting season about 1,000 farmers, farm labourers or their family members became victims of threshing accidents. A large number of these victims have to undergo amputations, and they become crippled for the rest of their lives. (Medical rehabilitation of upper limb amputees is extremely difficult in India and for a resourceless farm labourer, it is impossible in the majority of cases).

In recent years the joy of the harvest season has been taken out of the lives of thousands of families as their bread-winning members have had their fingers removed and their limbs chopped by the machines now being increasingly used for the threshing of wheat, specially in the green revolution areas. Every year during the harvesting season hundreds of these maimed and grievously wounded persons crowd the corridors of the hospitals in north India.

Largely two factors are to be blamed for evoking this tragedy during the harvesting season. First the use of sub-standard machines. Manufacturers of threshers have played havoc with the lives of hundreds of farmers and agricultural labourers for the sake of saving a few rupees on the threshers manufactured by them. The risk proneness of these machines is decided, largely by the length of the feeding chute and the length of the covered space between the feeding hopper and cylinder. Acccrding to expert opinion the minimum length of the feeding system should not be less than 90 cms., while the length of the covered portion from the side of the cylinder should not be less than 45 cms. However, it has been found in most threshers that the lengths provided are respectively about 55 cms and 25 cms. This factor alone should have contributed to a very large number of accidents. A large number of fabricators of these machines are unapproved manufacturers who in a bid to provide a cheaper machine than the one provided by the approved manufacturers, take resort to all sorts of cost-saving devices, in the process endangering the safety of the farmhands.

But another factor, carelessness in operating the machine on the part of the users, should not be underestimated. At the harvesting time the farmer is in a hurry to thresh the wheat and the labourer to earn the maximum during the short harvesting season when thereis no lack of employment opportunities for them. This hurry to get the work done is compounded further if the farmer does not own the threshing machine but has hired it from a neighbour on the basis of per hour rental. He tries to minimise the rent payment by maximising the speed of the work. In the process the labourers are prodded to work nonstop for very long hours. It is also not unknown for the farmers to make them work harder and not feel the stress of the continuous hours of work.

Sometimes safety devices are deliberately removed to speed up the work. Occasionally threshing work is carried out at nights (specially if the supply of electricity is not available during the day time) in poor lighting conditions. Sometimes when a labourer trained in threshing work is not available, the farmers compel some inexperienced labourers to carry out the threshing work which frequently leads to accidents.

In view of the high rate of thresher accidents it is extremely unfortunate that while several government departments have been issuing directives and statements, in terms of concrete results not much has been achieved by way of reducing the injuries caused by threshers. Basically, efforts have to be made

in two areas. Firstly in the use of safe machines. Scientists should try to fabricate machines which are safe, but at the same time inexpensive and safety devices do not come in the way of working at reasonably good speed. Only then will the machines be accepted by the farmers. By developing a system of licensing all manufacturers and permitting the sale of only the licensed models of threshing machines and taking action against the sale of unauthorised models it can be further ensured that only the properly fabricated machines are used. Still the problem of the substandard machines already in use will remain. The use of the more dangerous machines has to be prohibited, while special drives to carry out improvements in the existing machinery within the villages to make them safer have to be carried out.

Secondly, special cells have to be set up in the labour departments to help the farm labourers in getting adequate compensation. Suitable legislation for the payment of compensation to agricultural workers and changes in the Workmen's Compensation Act are necessary for this purpose. The fear of having to pay compensation will force employers to use safe machines and not to over-burden the labourers.

Pesticides Hazards

Chemical pesticides constitute another major hazard for farmers and farm workers. The following pesticides whose use is banned or severely restricted in several countries are used quite extensively in India.

Name of Pesticide	Quantity consumed (tonnes)
DDT	7,500
BHC	33,000
Methyl Parathion	3,000

Not only are more of these toxic pesticides being used in India than in any other western country, these are also being used much more indiscriminately and with such glaring neglect of precautions as cannot be imagined in the advanced countries where there is great deal of public consciousness about the various short and long term adverse effects of these chemical poisons.

A survey of farm workers/farmers engaged in spraying of pesticides and dusting operations in five districts of the State of Gujarat revealed that "none of the labourers were provided with masks to prevent the inhalation of toxic chemicals. Goggles to protect the eyes were also not available. Only 50 per cent of the workers took the precaution of covering their nose and mouth with a cloth. Besides 20 per cent of the workers did not wash their hands after completing the operations and of those who did, the percentage of workers not using soap was 64, though washing with water alone is utterly inadequate".

According to a recent report in the *Times of India* by Praful Bidwai, "All the 14 pesticides industry executives..... admit that most toxic chemicals including those that have dermal toxicities are mixed by hand."

Unfortunately this ignorance and neglect appears to have permeated the official agencies supposed to be responsible for the safe use of pesticides- when the National Commission of Agriculture requested the various State Governments to furnish information regarding the imported pesticides being used there, it got a very poor response from which it concluded, "information regarding the imported pesticides does not specify all the chemicals imported. Many imports are simply listed as "Pesticides Not Specified Elsewhere".

The ignorance, moreover, was not only confined to imported pesticides. As the Commission noted in its Report, "None of the states appear to maintain a complete record of the type and quantities of chemicals and pesticides used annually, Nor is there any uniformity in the maintenance of records." The task of setting up insecticides testing facilities, despite the availability of a central subsidy for this purpose, has also been neglected by several States.

The conditions are conducive for the indiscriminate use ot highly toxic pesticides to continue without being checked, accentuating the hazards of pesticides use. The revelations made some time back before an inquiry commission that the large scale serial spraying operations undertaken in Tamil Nadu were introduced more to make money for persons in high places (they got a share of the cut in the contracts given to the private operators of spraying planes) come as a shock to ecologists. Cotton farmers in Haryana are also reported to have protested against the aerial spraying of pesticides as this did more damage to the other crops and fodder grown there than it benefitted the cotton crop.

India Today (April, 1981) reported, "Last month agriculture officials of Andhra Pradesh, announced

the sale of non-permissible time barred chemical pesticides valued at Rs. 35 lakhs, stockpiled in government godowns. If the auction sales go through as planned by mid-April and the chemicals, whose shelf life has expired, are sold to farmers, the results could be catastrophic, as some pesticides turn into highly toxic substance following decomposition."

Recent news reports from cotton growing areas speak of'thousands of cases' of pesticides poisioning and dozens of cases of cancer, stunted growth of farm worker's children, deformities, blindness, diseases of the liver and the nervous system. Both because of the extensive use of toxic pesticides and the lack of elementary precautions, it is likely that India is somewhere at the top of the countries reporting the maximum cases of pesticides poisoning.

Looking at this problem in another context, it may be asked that if suitable legislation to protect farm labourers is enacted and they start receiving compensation money to what extent will it be possible for small and medium farmers to pay a large sum of money? Perhaps some provision can be made in the legislation, making the employer responsible for long term rehabilitation of the victims instead of being asked to pay a lumpsum. In addition, of course, the government can provide money from its own funds to these victims. However the punishment to employers should not be relaxed beyond a point, as otherwise the pressure for safe use of machines will become less.

In the case of big farmers employing dozens of workers, the need for showing such concern for the paying capacity of the farmer is much less. The working conditions at several of these farms are extremely bad. A recent report from a government managed cattle-breeding farm in Dumraon area of Bihar described the plight of several labourers.

Dipa Yadav and Shiv Prasad Yadav, had their hands chopped by a fodder cutting machine several years back. They have still not been paid any compensation. Wages for the period of their hospitalisation were also deducted. Kedar Nonia was attacked by a buffalo and he died. No compensation. Masuri Mali fell from a tree and died while performing his duty. No compensation. Other dues also not given to his widow. Sudarshan Yadav's right foot had to be amputated following a tractor accident. No compensation.

Another aspect of occupational accidents in rural areas is related to the risks faced by forest labourers. The following account is written in the context of forest labourers in the western Himalayas (Tehri Garhwal district).

The rampant poverty in hill regions ensures that the contractors do not have any difficulty in mobilising enough labour to work at low wages in revolting conditions. In fact these labourers anxiously wait for their contractors to return from the auction of forests so that they can get their advance payments, give to their family and set out to work.

Usually the contractor does not send his labour to a forest near the village but to one that is situated at a considerable distance from his home. In the forests of Uttarkhand it is common to come across labourers from Himachal Pradesh, Kashmir and Nepal. On the other hand, the labour from Uttarkhand specialising in lifting logs can be found in several hill regions outside Uttarkhand. The reason behind employing the labourers away from his house is that such labour is more at the mercy of the contractor and he can take as much work out of him as he wants. Another advantage of migrant labour is that there is nobody to make inconvenient inquiries or press for compensation if the worker is injured or dies in the course of the contractor's work.

Quite apart from the fact that the work done by the forest labourers is of an extremely exhausting nature, most of them look a decade older than what they actually are, and complain that they are incapable of doing any hard work when they return home after working in the forests for a few months, it also makes them very much susceptible to injuries. The labourers engaged in felling trees have to climb over 70 feet high coniferous trees which do not offer much support for climbing and carry out loping operations (cut off the branches of the trees), all the while clinging to the tree in a precarious position. The cases of these labourers falling from these trees into the deep valley below and seriously injuring themselves or even losing their life, are not infrequent. Similarly the labourers lifting sleepers live with the constant hazard of slipping on dangerous slopes and having their limbs crushed by sleepers. Other labourers while swimming in ice cold rivers to assist the flow of logs are sometimes carried away by the rapid current of the river and are drowned.

In the event of injury of illness no medicare is available nearby and the workers usually cannot

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afford to go to distant hospitals. Due to all these reasons a large number of deaths take place at the work sites. In most cases the dead are buried under the cover of darkness. Such is the hold of the contractors over their labour force that labourers hesitate to talk about the death of their companions, or inform their family members of the tragedy. A sum of Rs. 20/- or so to cover the cost of the coffin is in some instances the only compensation provided. Significantly enough, when the widow of a labourer who had died in similar circumstances approached the 'maldaar' to give her some compensation, he replied, "I do not employ any labourers. I employ only contractors." Since the labourers are not employed directly by the 'maldaars' or by the Forest Corporation, it is easier for them to evade the responsibility of providing compensation.

The work of the forest labourers is extremely tiring and exhausting. The labourers employed in lifting sleepers cannot work for the third day after working for two days, and if they persist in doing so they will collapse.

Carrying one to two quintals weights on their weak and undernourished bodies across dangerous terrain day in and day out, starting in their early teens and continuing right till they are incapacitated or otherwise rendered incapable of pursuing their exhausting work any longer, these unfortunate children of the Himalayas truly lead the life of the beast of burden. Their toes are worn out from their daily struggling on difficult terrain. Their back bears the mark of the heavy logs carried by them for several years, and after years of continuous work it becomes difficult for them to lie on their back. Their joints also start suffering continuous pains, which makes them incapable of rendering any manual labour at relatively young age. The labourers, including women, engaged daily for long hours in sawing operations involving heavy breathing fall easy victims to tuberculosis.

(More recently commercial falling of trees in the area has been temporarily suspended).

V. ACCIDENTS AMONG TRANSPORT WORKERS

(i) Railways :

The Statistics of injuries to Railway employees relate to injuries to all railway employees which are inclusive of those due to the movement of trains and railway vehicles, train accidents and causalties on railway premises and workshops. For statistical purposes a railway employee is considered as injured when the injured worker is prevented from returning to work for 48 hours after the occurrence of the accident.

According to a recent report in the *Indian Express* "The Railway Reforms Committee has taken the railways to task for adopting an almost cavalier attitude to the safety of train operations. Its report attributes the four-fold increase in rail mishap deaths in one year to the fact the recommendations of earlier expert committees on accident prevention have not received the attention they deserved.

"We have gathered an impression that accidents inquiries have often ended after explaining the cause as 'human failure' and have failed to come to grips with the real causative factors even when such human failures have been repetitive... Safety had often been compromised because of extraneous reasons, and safety measures", the committee says. A report in *Patriot* titled Rail Workers exposed to Electrocution (March 18, 1982) by Pradyot Lal says that to overcome obsolescence somewhat the Indian Railway adopted the then brand-new technology of electric traction on 5 KV Ac system time back. This acquisition has since helped in speeding up train services, line capacities have increased, haulage cost has been reduced, but 232 workers have died while working at the new technology of electric traction and over 600 have reportedly been hit by electric shocks.

Those working on electric traction lines run a high risk, especially if the section insulator point (only 17 cms in length) that lies between a runner and live wire is not covered by a protective screen as stipulated in Electric Traction Manual and the Indian Electricity Rules. The railway traction workers are seldom provided with the protective screen. The Indian Railway Traction Worker's Association (IRTWA) has listed various instances of such violations in its communication sent to the Chairman, Railway Board some time ago. IRTWA feels that the safety measures as contained in the Electric Traction Manual (ETM) and Indian Electricity Rules (IER) do not apply to them. In the absence of even the most minimum safety measures, the Railways Traction worker is always liable to fall a victim of severe health hazards, and the Association cites many such cases. Expla-

ining the processes by which such hazards take place, an IRTWA document states, "the singlephased high voltage electric traction lines not only transmit, but also distribute current and voltage to the engine through the pantograph. This pantograph remains in loose contact with the Traction lines, the circuit of which gets completed through the motors of engine and tracks up to generating point. Thus the energy transmitted by overhead line creates an induced current effect and also causes electric flux within the radius of 108 meters of the traction lines." The impact of induced current within this ambit could lead to loss of muscular control, heart fibrillation and brain damage.

Another frequent hazard occurs when a worker contrary to IER stipulations, is forced to erect metallic ladders between up and down lines. According to the rules, no metal erection is to be made within 10 metres of a live wire. But the railways traction workers can have none of these precautions and are made to erect ladders within the danger zone of two metres of a live wire. The danger persists even when power is blocked on one line, since the other line remains alive. Points out the IRTWA.

Faulty planning leads to the designing and construction of 'breaking mains' and cante-lever carrying separate lines within the danger zone which is prohibited as per rules. If these break mains or or cante levers are not maintained as required or not checked and replaced immediately when old, a dead wire may turn into a live wire.

Other regulations which are usually violated include the absence of a regular checking system of earthing pits, which is a statutory requirement to keep the bonding system working. There is no proper inspection kit for examinig electric locomotives in the station yards and electric locosheds. As a result inspection and repair of electric locomotives often leads to electrocution, and such accidents have taken place in Bhilai, Mughal sarai and Howrah causing partial disablement and even death.

TABLE-6

INDUSTRIAL INJURIES IN RAILWAYS AND FREQUENCY RATES, 1962-76

YEAR (Ending 31st March)	FATAL INJURIES Number	FATAL INJURIES Rate per 1,000 workers	NON-FATAL INJURIES Number	NON-FATAL INJURIES Rate per 1,000 workers
1	2	3	4	5
1962	353	0.30	46,713	39.59
1963	325	0.27	40,939	33.64
1964	350	0.27	42,179	33.06
1965	365	0.28	39,271	29.66
1966	395	0.29	37,514	27.62
1967	358	0.26	35,484	25.90
1968	341	0.25	32,928	24.08
1969	341	0.25	29,766	21.91
1970	378	0.28	28,662	21.02
1971	327	0.24	26,568	19.27
1972	342	0.25	26,063	18.69
1973	279	0.20	27,060	19.12
1974	279	0.19	26,595	18.53
1975	301	0.21	27,105	18.71
1976	352	0.24	30,499	20.88

SOURCE: Railway Board.

(ii) Ports & Docks :

A 'reportable' accident according to Regulation 12 of the Indian Dock Labourer's Regulation, 1948, and para 4 of the Dock Worker's (Safety, Health & Welfare) Scheme, 1961, is one which either causes loss of life to a worker or disables him from work on which he is employed for more that 48 hours following the accident and for which notice is to be given to the Inspector in writing in a prescribed form by the employers of the workers :

Table-7 - Reportable Accidents in Ports-1961-80

Year	Fatal	Non-Fatal
1961	12	4,729
1962	24	4,983
1963	23	5,418
1964	27	5,819
1965	26	5,959
1966	31	6,022
1967	38	6,049
1968	26	5,616
1969	22	4.257
1970	21	3,213
1971	11	2,929
1972	18	2,774
1973	15	2,250
1974	18	1,919
1975	30	1,794
1976	19	2,070
1977	22	2,206
1978	19	1,828
1979	21	1,548
1980	11	1,420

Source : Director General, Factory Advice Service and Labour Statisics.

A report on the dock workers in Bombay by Gayatri Singh published in the Economic And Potitical Weekly indicts the lack of elementary protective equipment for contract labourers. "In the sheds where he works lifting heavy cargo, he is very seldom provided with gloves, so that at the end of a day's work his hands are severely mauled. He is not provided with shoes. In view of the fact that in every shed hundreds of nails and metal pieces lie all over the place and the chances of being pierced by one of them and contracting tetanus is very high, this is a gross violation of the basic right of a worker to protective clothing. Sheds are not provided with exhaust fans as a result of which carbon monoxide exhaust from the work-lifts completely fills the sheds after the lifters have been in operation for a few hours. When he is working deep down in the hold of the ship he is not provided even with a helmet, even though cargo is continuously being lifted by slings directly over his head. Hundreds of workers have been killed or even disabled in the docks due to cargo falling on them from a height,

"Contract workers are the only workers who can be forced to work on ships carrying dangerous chemicals without protective uniforms. Some time back a Russian Ship carrying naphthalene came into Bombay port. The registered workers of the Bombay Dock Labour Board refused to work on the ship without protective uniforms. The authorities of the port were only too happy, for they now had a ready reason to use cheap labour. Instead of providing these registered workers with protective clothing, they used contract labourers. They worked on the chemical without gas masks, shoes or gloves. Workers handle cargoes of urea, sulphur and oil in similar conditions. Sulphur in the holds of the ships, often catches fire and burns silently without any danger of spreading. Contract workers are compelled, in the course of their work, to walk over burning sulphur without shoes. On the fertiliser ships the holds are filled with minute particles like a thin fog. Protective covering for the mouth and nostrils, if any provided to the workers, consists of a thin strip of cloth which does nothing to prevent the particles from entering the workers's lungs..... There are over 5,000 workers in the Bombay port".

A recent report on the Dock Workers of Calcutta drew attention to the high accident rate.

"The more the extent of double booking, the more the profits for the stevedores. The poorly paid workers are easily tempted into double booking, though such labour tells on their health. Double booking means almost non-stop toil for 16 hours and such practices also naturally tend to lower labour productivity. The total exhaustion of workers results in many accidents and even death due to over-work is not uncommon A few weeks back, three workers

who were engaged in their second shift died while unloading cement. The stevedores, who are basically middlemen and contractors of labour, are also known to resort to unwritten contracts with a section of the workers in return for the promise of higher volume of workload in lieu of a certain cash subsidy and thus block the extra job-potential."

According to a report by Sujata Patel (EPW) on contract workers employed in Kandla Port, Gujarat, "the contract workers unload iron scrap of all kinds, pointed, heavy, wires, blades and nails which are often rusted." Some of them are not provided with gloves and most, if not all, have bandaged hands. Some who handle sulphur with their bare hands had burnt their hands and complained of constant sour taste and burning sensation in their intestines. Those handling wheat complained of dry cough 'pitchers of water' could not assuage.

Table-8
Reportable Accidents in Ports by causes, in 1976

Cause	1976 No. of accidents	1976 Percentage of Total
1. Lifting of Machinery and gear.	3	0.1
2. Transport	75	3.6
3. Struck by falling bodies	313	15.0
4. Persons falling	194	9.3
5. Handling of cargo	897	42.9
6. Stepping on or striking against objects	225	10.8
7. Handling of articles other than cargo	247	11.9
8. Harmful contact with	7	0.3
9. Struck by suspended objects	103	5.0
10. Miscellaneous	25	1.1
Total...	2,089	100.0

Source : Director General, Factory Advice Service and Labour Institutes.

Occupational Diseases

Accidents causing a large number of deaths and injuries among factory-workers and miners are frequently reported in newspapers. However probably even greater distress is caused by occupational or work-related disease — disease caused by long-term exposure to hazardous working conditions.

Posing this problems in the context of the USA Eric Eckholm has written, "The traditional threat of industrial accidents has begun to pale beside that posed by the occupational diseases that medical detectives are now identifying. The US Public Health Service has estimated that 3,90,000 new cases of occupational diseases appear anually in the United States while upto 1,00,000 occupational disease-induced deaths occur each year. But because many occupational illnesses develop silently and slowly, the dimensions remain totally unknown. The more the problem is studied, however, the more pervasive it proves to be."

In India where the workers are often exposed to much worse hazards compared to the advanced countries but where the facilities for proper diagnosis and treatment are minimal, this tragedy exists on a larger scale though this is not officially recognised

I. BYSSINOSIS :

After entering a textile mill near Rakhial Road in Ahmedabad, I was first taken by our guide, a union activist, to the place where cotton is first brought in

the factory. This is known as the blowroom. In the blowroom cotton dust particles in plenty were floating in the air. Workers had loosely tied a piece of cloth over their mouth, certainly a poor protection against the heavy concentration of cotton dust. The workers complained of respiratory disorders due to the inhalation of this dust. The symptoms they described resembled that o. byssinosis but they had not heard of a disease of this name. When it became difficult to continue working they went to the ESIS hospital and if the doctor was kind they got leave getting a payment of Rs. 10/- per day. In some cases, they said, they felt very weak but the doctors felt that they were fit to take leave without payment, Enforced leave on half-pay or leave without pay meant semi-starvation for their family and resort to loans on high interest rates.

Although we had entered the blow room soon after the lunch break the workers still looked dazed. Almost a similar picture was revealed in the carding room below. Here the workers did not even tie a piece of cloth over their mouth. The reason they gave was that there are many more workers in the carding room than in the blow room and tying a piece of cloth makes communication difficult among them. Here also the workers complained of various respiratory disorders but none, not even the union leaders, had heard of byssionsis. "The doctor tells me that a lot of kachra (dirt) has accumulated inside you and so you are bound to feel sick. He says that I should go on working and not ask for leave time and again on account of this", one of them told me. Respiratory problems in most cases were described as TB (Tuberculosis).

Almost all the workers talked to were quite sure about the close relationship between their health problems and the hazardous working conditions specially the inhalation of cotton dust. The problems are worse, they informed me, when the cotton is of a poor quality and contaminated with dirt. It was tragic to see several workers knowing fully well that the toxic dust was responsible for their serious illness and still continuing to inhale the same poision as they did not have any other alternative but to submit themselves to this gradual poisoning to their lungs. The workers also told me that sometimes the sick workers collapse while working in the mills. If a worker falls on the fast moving machine, he can be seriously injured.

Byssinosis is a disabling lung disease caused by the inhalation of cotton dust. It has been estimated that nearly one fifth (or even more) of all cotton textile workers are victims of this disease. However it may not be possible to conclusively prove that all these workers were afflicted mainly because of exposure to dust as the symptoms are such that these could have been caused also by years of heavy smoking or living in highly polluted environmental conditions or other such factors may be contributing to the deterioration of the victims' respiratory condition. But it can certainly be said that nearly one fifth of all cotton textile workers have serious respiratory problems for which a long-term exposure to cotton dust is responsible as a major factor.

Byssinosis passes through several stages. Workers susceptibility to this diseases also varies. Some may not become its victims despite inhaling cotton dust for several years while some others may be extremely susceptible. Similarly in the case of some workers it may be confined to one of the initial stages and despite several years of exposure may not pass to the last stage of reduced breathing capacity leading to permanent incapacity. In the first stage there is occasional chest tightness on the first working day of of the week (this is also the reason why this disease is often referred to as Monday fever). In the second stage chest problem on Mondays is consistent and in the next stage this problem starts affecting the workers on other days as well.

Hence theoretically at least it is possible to protect a worker from the last disabling stage of this disease by prventing further exposure to cotton dust after the disease has manifested itself in the first, second or even third stage. This may involve shifting the worker to some other industry or from jobs like the card room and the blow room to other areas where the exposure to cotton dust is significantly less. In practice, however, such opportunities are rare and the choice of the worker is often between continuing the hazardous trade which is the cause of disease or unemployment. In fact even if legislation is enacted to protect the affected workers in the early stages of the diseases by prohibiting them to continue working in the hazardous occupations, this may only result in the workers concealing their affliction and unless the workers are themselves willing to talk about it, there is no way in which this disease can be definitely established in the initial stages. However if the workers who have worked for several years in hazardous trades and as a result of it find themselves in the early stage of this disease are given an adequate compensation money then it may be

possible for them to rehabilitate themselves in some other alternative occupation.

A team of researchers from Central Labour Institute and two hospitals in Bombay made a detailed study of byssinosis in textile mills and recommended several measures to reduce dust such as replacement of multi-purpose, multi-phase blow rooms by single phase machines, enclosure with overhead hood exhaust on carding machines, air conditioning in the spinning area and better exhaust ventilation in the winding area. However it is unlikely that most of the textile mills in the country, several of which were referred to as industrial slums by a World Bank team will agree to implement any of these dust control measures. This despite the fact that in most mills the dust content has averaged around 200 mg./100 cu.m. (usually if the dust content is more than 100 mg./100 cu.m. control measures and medical checks become absolutely essential). The mills owners are helped by the fact that the existing legislation against hazardous dust emission has several loopholes.

II. PNEUMOCONIOSIS :

The scourge of pneumoconiosis, better known as the black lungs disease, was first identified in the beginning of this century, though the disease existed earlier also. Caused by longterm excessive exposure to coal-dust, this respiratory disease not only weakens the miners rendering them incapable of heavy work but can also prove fatal. According to an expert Dr. J. L. Kaw, "There is both clinical and experimental evidence to support that inhalation of coal or silica dust predisposes to tuberculosis. It hastens the course of the otherwise latent disease. The patient dies sooner or later due to heart failure or tuberculosis".

The incidence of pneumoconiosis is known to be extremely high, but from the point of view of paying compensation to the victims, this is not recognised and only a very small proportion, if any, of the actual number of victims of this disease in most of the collieries get any compensation.

The critical factors in controlling this disease are the levels of dust exposure and the adequacy of the ventilation system. From both these points of view, the conditions in Indian coal-mines have much to be desired. Studies made by the Central Mining Research Station (CMRS) show that the average dust exposure of miners in Indian mines exceeds the approved limits.

A random survey made by the CMRS revealed that in the Indian mines about 8 per cent of the miners suffer from this disease. According to Dr. P. K. Dutta, former President of the Indian Medical Association, about 60 per cent of the coal miners are not physically fit to undertake the hazardous and back-breaking job in the mines. He has also pointed out that even after several years of nationalisation no effort has been made to asses the incidence of occupational and chest diseases among the coal miners.

According to Dr. Dutta, the Government has 'cared the least' over the years for assessing the magnitude of this problem and finding remedies. "It is strange that almost no case of pneumoconiosis could be detected in the hospital of the coal mines welfare organisation and of the coal industry, inspite of the fact that hundreds of chest X-ray plates for diagnostic purposes are taken every day, and it is assumed that eight per cent of coal miners are suffering from this disease".

Some time back Mr. Vikram Mahajan, former Union Minister of State for Energy told the Rajya Sabha that asthma, bronchitis, tuberculosis and eye and intestinal diseases are widely prevalent among the coal miners. This has been disclosed in surveys conducted by Coal India and Coal Mines Welfare Organisation. Environmental factors associated with coal mining congested living, and unhygenic conditions, were stated to be the major reason.

Moreover, it is likely that this disease may aggravate with growing mechanisation in the coal industry. As Dr. Kaw has written in the general context of all dust related diseases "In general the size and amount of the dust produced in any operation depends upon the speed of the impact. This has particular relevance to the mining industry. Operations which involve hand driven tools do not produce such dust of respirable size. On the other hand in mechanised mines where high-speed drills, crushers and saws are used, dust of very small particles size is generated.....It is this dust of very small size (less than 5 microns) that are most harmful".

A recent report in the *Indian Express* on the plight of miners in Jhagra Khand coal-mines in Madhya Pradesh, where nearly 20,000 labourers are employed, said that suffocating conditions exist in most mines. "What the authorities have done is to go on opening district after district in every mine without bothering about ventilation. Most of the exhaust fans appear to be out of order. One worker said that whenever mining inspectors visited the mines, the managers ordered fences to be put around the "suffocating districts" to show to the inspectors that no work was being done there. As soon as the inspectors left the fences would be removed.

The same report quotes Dr. P. C. Naik, Superintendent of the Central Mines Welfare Hospital at nearby Manendragarh as stating that pneumoconiosis is a very common disease in this area. As the loaders have to move immediately to their place of work after blasts, their lungs invariably have deposits of gas and coal dust, causing a disease called pneumoconiosis. After some leave time the victims become prone to tuberculosis, bronchitis and asthma.

Despite of all this, medical facilities are minimal. The Western Coalfields management has not provided any hospital, not even an ambulance, at as many as five collieries of this area. Most posts of specialists at the Manendragarh hospital remain unfilled for years. The 50-bed TB sanitorium in the hospital is headed by a junior physician. The drinking water available to the miners is dirty and often full of coal dust.

In Dhanbad Central Hospital the death rate is abnormally high - nearly 500 to 600 coal miners admitted here die every year. Trade Union activists have alleged large scale corruption and othe irregularities in the functioning of this hospital.

The fromer Union Energy Minister Mr. ABA Ghani Khan Choudhry said some time back that the Government proposes to issue health cards to seven lakh coal miners in the country. The cards will contain all data regarding the worker's medical condition to enable speedier diagnosis of workers when involved in any accident or affected by any disease. If this happens, then at least one important step in improving the medical facilities for workers would be taken, but it remains to be seen to what extent it is implemented honestly.

III. SILICOSIS :

What do the widely different occupational activities in different parts of the country - Slate pencil factories in Madhya Pradesh, mica-mines of Bihar, agate workshops of Gujarat and ceramic factories in Delhi - have in common ? The answer — exposure to the high levels of silica dust leading to a disabling respiratory disease called silicosis.

Dr. R. Lobo-Mendonca, an expert on occupational health, describes the basis of this disease in the following words :-

"Silica particles ranging from 0.1 to 3 microns are the most dangerous. They reach the alveoli where they are engulfed by phagocytes. Whereas most dusts are carried by the phagocytes to lymph glands and left there as harmless deposit, fine silica particles destroy the cells and set up a fibroblastic reaction in the lungs. The scar tissue gradually encroaches on the healthy lung and, when the disease is advanced, causes shortness of breath, diminished chest expansion, and increased susceptibility to tuberculosis".

Dr. Lobo-Mendonca has identified the following industrial activities where susceptibility to silicosis is high :

1. Filling abrasive detergent powder into cartons, espcially when this work is done by machines;
2. The process of de-scaling of boilers of the locomotives in railway workshops;
3. Crushing and grinding of flint and scouring of bodies in manufacture of potteries;
4. In tile manufacture tile pressure, dressing and fetting;
5. Manufacture of fireclay bricks and other refractories;
6. Manufacture of glass, where silica is the main ingredient;
7. Etching with the help of sand, a process used in a number of industrial activities;
8. In foundries, the removal of casting from the mould and cleaning of castings;

9. Grinding of minerals like ochre, folspar, quartz etc.
10. Sieving of dust preceding oxychloride flooring used in railway coaches and mills;
11. Sand blasting work (i. e. cleaning, smoothing, roughening or removing of part of the surface of an abrasive viz. a jet of sand, metal shot or grit or other material). Sand blasting is used for removing sand from castings, for etching glass, producing the desired surface on metals, treating wood and ivory and removing paint from walls of ships. Workers engaged in sandblasting become susceptible to silicosis at a much earlier stage compared to other operations involving exposure to silica-dust.

Researchers from the National Institute of Occupational Health have learnt that the workers employed in the quartz works at Godhra (Gujarat) are exposed to dangerous levels of silica dust resulting in their high susceptibility to silicosis. According to a senior scientist who has visited the quartz work sites in Godhra said that unless preventive steps are taken immediately the industry will claim several lives in the near future.

A detailed study of agate (an impure variety of quartz) workers employed in Khambat, Gujarat, has also revealed a high incidence of silicosis. During processing of agate, specially grinding, a lot of silica dust is produced. Inhalation of this dust causes various categories of silicosis, and also increases the susceptibility of workers to other lung diseases like tuberculosis and chronic bronchitis.

Scientists of the Industrial Toxicology Research Centre (ITRC), (Lucknow), found a very high incidence of various lung diseases in the agate workers (63.5 per cent). Advanced cases of silicosis were detected even among children.

The Chief Advisor of Factories carried out a study in 1961 in collaboration with the Chief Inspector of Mines, Dhanbad, in lead and zinc mines, in Rajasthan. This study revealed 52 cases of silicosis out of the 171 miners examined radiologically.

More recently, on November 10, 1982, the Rajasthan Health Minister Mr. Khat Singh Rathore while inaugurating a conference on tuberculosis and chest diseases said that 75 per cent of mine workers in Jodhpur suffer from these diseases.

A Government of India study on the incidence of silicosis among ceramic workers revealed that 127 workers were affected of the 808 workers examined in 12 industries in different parts of the country. Thus this study revealed that 16 per cent of workers with 5 years or more services were silicotics. Some of the industrial units examined in the course of this study were found to be grossly unhygienic. However. the most attention to the threat of silicosis has been drawn in the context of the tragic life (and death) of the slate pencil workers of Mandsaur, in Madyha Pradesh.

Although as many as 4,000 workers are employed in the mining of shale plates and the manufacture of slate pencils in Mandsaur district the directly employed permanent work force of slate pencil factories consists of only about 1,000 workers. Most of these workers are employed in the process of breaking slate plates into smaller pieces on electrically or diesel operated saws. This process releases a lot of dust from the slate plates which being light, floats around in the air and settles on the body of the cutters (and to some extent also on the bodies of other workers present around). A good part of this dust also finds its way, through the nose and the mouth, to the lungs and causes the deadly disease silicosis.

Although machines for the removal of dust have been designed and their use also been made compulsory by laws, most of the manufacturing units have not installed these machines. Cases for the payment of compensation to the victims of silicosis or their dependants pile up in the courts, while the workers die and their families starve.

It is apparent from what has been stated above that silicosis is a threat to workers in a multitude of industries, several of them in the unorganised sector where no inspections are carried out and no medicare worth the name is available. Thus although several preventive methods in the form of alternative working processes involving less omission of dust and proper ventilation are available, the battle against silicosis is going to be a difficult one stretching over a long time.

IV. ASBESTOSIS

The consumption of asbestos, a fibrous mineral having several industrial uses, in several industrialised countries has followed a strange pattern -- years of rapid growth followed by a sudden downward trend. In earlier years the use of asbestos increased rapidly because of its high resistance to heat, corrosion, and moisture as well as its strength and durability. It was used in a very wide range of products — floor tiles, wall boards, insulators, water pipes and brake linings. Asbestos was found particularly useful for insulating building and ships.

Later, however, the use of asbestos declined suddenly because of the several hazards associated with its use. Inhalation of its fibrous dust, it has been found, can cause a serious disease called asbestosis. The main symptom of this disease is shortness of breath which can eventually become incapacitating and cause death. Depending on the susceptibility of the individual worker and the intensity of the exposure to this dust in the factory or mine, asbestos may kill in less than one year or take as much as 10 years to manifest itself.

The hazards of asbestos, moreover, afflict not only the asbestos workers and miners but in many cases also their families. Just because they washed their clothes after they returned from work, the daughters and wives of several asbestos workers have found themselves falling victims to the diseases caused by this poisonous mineral.

Even the end users of asbestos products, for instance those who drink the water coming through asbestos pipes or who live in buildings where asbestos has been used, may also one day be attacked by asbestos-related diseases. Symbolising this concern over the hazards to the end users, some years back Yale University (USA) replaced all the ceilings in its ten storey school of art and architecture because dangerous asbestos fibres were flaking off them in alarming quantities.

Due to the growing public consciousness of these various health hazards, the reliance on asbestos has been significantly reduced by several industries in some developed countries. Nevertheless this mineral continues to be used on a large scale in several countries. In countries like India where its various health hazards have not received adequate attention, there is a general lack of awareness of its health hazards among workers as well as end users.

In the biggest asbestos mine at Roro in Singhbhum, for instance, the working conditions have been deplorable. The United Mineral Workers' Union has alleged that asbestosis has been steadily spreading among miners and their families, and safety measures are being neglected. Mr. Purendra Muzumdar, General Secretary of this Union, has alleged that deaths of several miners had been caused by the excessive exposures to this fibrous dust. According to him hundreds of miners and tribal villagers have died of asbestosis since 1964. At the asbestos crusher plant at Roro, he said, all precautions have been ignored.

The Roro asbestos mines run by the Hyderabad Asbestos Cement Products have been employing nearly 1500 tribals. Dust from the mines and and crusher plants has brought serious disease for the workers and neighbouring villagers. A survey conducted by Robert John Hamilton of the ILO and Dr. B. K. Sen Gupta, Assistant Director General of Mines in November, 1978 is reported to have revealed that these mines have endangered the life of the miners as well as the villagers living near these mines.

An American Multinational manufacturing asbestos products which has been flooded with damage claims by diseased workers has also entered into collaboration with an Indian firm which produces nearly 50,000 tons of asbestos cement pipe sheet per year at its Ahmedabad plant. Reports on this factory indicate that the workers are not given shower facilities and those working part-time also do not get proper masks to protect them from fibrous dust. Handling of wastes also neglects the minimum safety norms — wastes are just dumped outside the factory premises and children play at these waste dumps, oblivious of the danger it poses to them.

A survey conducted by Dr. D. Banerji in an asbestos cement factory (published in the Indian Journal of Industrial Medicine) has found high concentrations of airborne asbestos and diagnosed asbestosis in a quarter of the workers (working for more than five years on the job).

Another researcher Rakesh Madan after examining a Bombay-based plant producing brake-linings using

asbestos found that while the dust level was high the workers were not warned about its dangers and even not informed of their disease when chest X-rays of workers revealed asbestosis. A recent newspaper report on this same factory said that while some workers suffering from asbestosis had been fired "at least 35 per cent of those still on their job are afflicted and yet are neither discharged nor duly compensated".

According to a study conducted by the Central Labour Institute, in an Ahmedabad-based cement asbestos plant, 6.5% of the 320 workers examined suffered from asbestosis. Workers identified as suffering from asbestosis are known to have been retrenched from this and other units.

According to a recent report in *Business India* 21 workers suffer from asbestosis in a medium scale asbestos textile manufacturing unit in Andheri, Bombay. This report also quotes A. Banerjee, a trade union leader from an asbestos firm as stating, "we have absolutely no control equipment. And the best we have is a few exhaust fans. Respirators are unheard of, workers are simply given a piece of cloth which they tie around their noses and mouths. In fact the management has not bothered to provide workers even with proper working clothes". According to Banerjee the working conditions are even worse in the nine subsidiary units of this company located in and around Bombay which are engaged in related activities like grinding and asbestos matress manufacturing.

Almost all the big asbestos manufacturing firms in the country are either subsidiaries of western multi-nationals or have acquired technical collaboration from them.

International links of asbestos

Table 9

Imports of raw asbestos — **Metric tonnes**

Year	Actual Imports
1978-79	62,707
1979-80	75,470
1980-81	84,264
1981-82	80,854

Portwise imports are in the approximate range.
a) Bombay - 60%, b) Madras - 20% and c) Calcutta - 20%.

Source : MMTC.

Table 10 : Major Asbestos Companies in India

Name of Company	Products	Nature of TNC link
Hindustan Ferodo	Brake linings, jointings limped sheets, yarns, packing clost, textile mattresses and millboards.	Turner and Newall, U. K. *(T & F)
Hyderabad Asbestos Cement Co.	Asbestos Cement Sheets & pressure pipes, jointings, millboards & thermal insulation	Johns Manville, USA (T) & how Societa Italian Perl Aminto Italy (T).
Asbestos Cement Co.	Asbestos Cement sheets	Turner & Netwall, U. K. (T & F)
Shree Digvijay Cement Co	Asbestos Cement sheets and pressure pipes	Johns Manville USA (T&F) Abex Inc. USA T&F.
Sundaram Abex.	Friction materials like brake linings.	
Suri Asbestos Industry.	Textiles, packings, ropes, laggings, jointings, yarn etc.	Johns Manville, USA, (T&F).
Rane Brake Linings	Brake linings and clutch facings.	Small & Parkers,U.K.(T&F)
Reinz Talbros	Asbestos jointings	Reinz Dichtungs A.G. West Germany (T&F)*.

*T : Technical; *F: Finacnial.

Source : DGTD Handbook of Foreign Collaborations 1980.

V. HEALTH-HAZARDS OF TOBACCO WORKERS

With an annual production of over 365 thousand tonnes, tobacco provides employment to millions of people in processing activities, mostly in the traditional non-factory sector. These workers are among the most exploited sections of the working class. Right from the harvesting stage (which leads to symptoms of nausea and giddiness among the workers) to the manufacture of bidis, the tobacco workers are paid low wages, exposed to diseases without any provision for protection or medicare and deprived of various benefits and facilities to which workers in the organised sector are entitled.

According to a CSIR survey nearly 3 million workers are employed in the manufacture of bidis, nearly 2.8 million of them in the nonfactory sector in the manufacture of bidis has been increasing in recent years. This is because the manufacturers have been anxious to avoid the protective and welfare aspects of labour legislation which they have to implement if they operate in factories employing more than 20 workers. Even where the factory system has been retained, the factory is divided into smaller units or 'branches'.

The most frequent method employed by the manufacturers, however, is to lease out the work to beedi rollers to be done at their homes. The manufacturers provide them tobacco and wrapper leaves, and take back rolled-up raw bidis. The workers are paid on piece rate basis. A large number of bidis are rejected on the slightest pretext and the worker is not paid for this work; instead often some money is deducted for the raw material 'wasted' by the worker. According to a study of bidi rollers in the Nipani town of Karnataka made 4 year ago, generally a family is unable to roll more than 1000 bidis in a day and for this the family gets a paltry payment of Rs. 4 70. The plight of the rollers in such activities as cutting the leaves, is even worse than that of the bidi rollers.

Constant exposure to tobacco fumes exposes the workers to diseases like TB, asthma, allergy, and continuing cold. Long hours of continuous sitting repeatedly doing the same work leads to backache, body ache, stomach ache, gas trouble, piles and rheumatic complaints. Bidi rollers working at night also inhale kerosene fumes.

In a study of bidi workers in Kerala made by M. Mohandas it was found that nearly one-third to one-fourth of the bidi rollers (or their helpers) suffer from TB. 36 percent were suffering from some other disease, which were traced by almost all of them directly or indirectly to occupational factors.

In this study it was also found that 91 percent of the workers earned less than Rs. 200/- per month. Only 22 percent of the workers in factories reported proper ventilation, 17 percent reported availability of drinking water and 12 per cent reported toilet facilities.

Several laws have been enacted to help bidi workers, but manufacturers have always found ways of avoiding them. At several places the response to such legislation has been to move to rural areas in small units and ask the workers to roll bidis at their homes. In Karnataka when laws were enacted to classify even such workers who worked at their homes as permanent workers if they had worked at their homes for more than 3 months, frequent changes were made in the names of workers so that they could not claim the status of permanent workers. As the ESI Act does not apply to these workers at present their biggest problem is that while they face severe health hazards, no medicare facility has been made available for them. The wages are so low that have to work continuously without any break of holiday to get some money worth the name.

The plight of old bidi workers who have spent several years in this trade is specially bad. This is because after some years of this monotonous work their fingers gradually become numb and begin to lose the capacity to roll bidis efficiently. Thus as age advances and the family grows, earnings often begin to decline,

Apart from the trade bidi-rolling, a large number of workers specially women, are employed in godowns for pounding tobacco. In a study of the plight of tobacco workers of Nipani, Anil Avachat vividly described the working conditions of these women. "There is no ventilation; daylight never enters here. The atmosphere is full of tobacco dust, causing choke and cough all the time. The dust that is raised is so thick that it is impossible to see even one's neighbour. It bathes the women from top to toe..... If the tobacco has been sprayed with insecticides, the work becomes even more

dangerous. The insecticide seeps into the body and the women begin to have sudden unexpected bouts of fever".

Sometimes back I observed similar working conditions at a snuff manufacturing factory in Ahmedabad, called Chakriwala Estate. It was not possible for me to stand even for 3 minutes in this dust laden atmopshere but the workers, mostly women, were working there every day for over 8 hours without any protective equipment. Complaints of vomitting, nausea, giddiness and headaches are frequent among them. No rest place which would enable them to sit and recover has been provided. Some women who have been working here for more than two decades still get less than Rs. 300/-p.m.

According to a study "Health problems of Tobacco Processing Workers - some impressions" by Dhruv Mankad, "The process of converting raw tobacco into processed zarda or beedi zarda consists of a number of part-manual, part-mechanical operations of winnowing, sieving and pounding. At times all these are done with the help of machines. Finally various grades and kinds of tobacco are blended into mixture as required for a particular brand of beedi. The whole process particularly winnowing and blending, cause a lot of fine tobacco dust to fly up into the air of the closed rooms that pass-off as factories. For a new comer it is impossible to stand there even for half a minute without retching or getting a bout of coughing and sneezing. New recruits often feel giddy and vomit while working. The whole process also entails direct contact of the skin with tobacco. During the blending which is done with legs, the heat generated by constant sprinkling of the tobacco zarda with water is a problem added to the risk of constant skin contact.

Another aspect of the tobacco trade is the plucking of tendu leaves which are used as bidi wrappers. It has been estimated that nearly six lakh workers are engaged in our country in collecting tendu leaves. While the contractors and traders have earned big fortunes in collection and sale of these leaves, the plight of workers mostly tribals, in most of the tendu plucking areas continues to be miserable.

VI. LEAD POISONING :

Lead water pipes, lead paints — ceramic cookware and containers of lead glazes even paints on pencils, these and a host of other products used by unsuspecting consumers all over the world — have in recent years attracted warning signals from experts who have been worried about the high and increasing intake of lead in the human system.

Wide range of mental and physical disorders ranging from increased incidence of still-births to 'criminality' have been attributed to high lead absorption. Dr. Claude A. Frazier, writing in the *Saturday Evening Post* went to the extent of saying that "although it is as yet unprovable at least a portion of urban apathy, violence, vandalism and the decreased performance of school children could be a result of lead in the environment. It is also my contention that it is past time that we find out if it is so".

Widely pervasive as the hazards of high lead absorption may be, these are visible in the most accentuated form in the case of those industrial workers who are regularly exposed to lead dust and fumes in the course of their work. This aspect deserves attention in view of the fairly high growth rate in the use of lead in various industrial units. With the increase of lead storage battery industries, lead chemicals alloy industries and primary and secondary refining units, the annual consumption of lead has risen to 75,000 tonnes.

Some of the common sources of lead absorption are in lead recovery, application of unfritted glaze, mechanical buffing of car bodies and the manufacture of batteries, paints, lead glaze for tiles, sanitary ware and pottery. According to Dr. R. Lobo-Mendonca, mentioned above, the worst hazards occur in the preparation of lead paste, trimming and brushing of formed plates, and recovery of lead from discarded batteries as in these processes workers are exposed to fine particles and fumes of lead. Polishing of types in small presses and cleaning of plungers in the same trade are two other activities about which this expert has voiced caution.

A recent study of seven major battery manufacturers which was presented at a seminar on this subject held at Udaipur in December, 1982, *(Indian Express*, Nov. 8,1982) revealed that 9 per cent of the workers suffered from lead poisoning while 65 per cent of

the workers were exposed to air borne lead above the permissible limits. Lead absorption and poisoning was less in plants where proper technical control measures were adopted.

According to a study of the Central Labour Institute, Bombay, (*Patriot*, August, 5,1982), specifications of the Indian Factories Act (1948) which recommended control of lead and dust and which accord the status of a notificable disease to Occupational Lead Poisoning, are being conveniently by-passed by most of the concerned industrial units.

The generally observed symptoms of lead poisoning include one or more of the following: tiredness, headache, sleep disturbances, loss of appetite, metallic taste, abdominal discomfort, constipation, colic pain, altered sensation of loss or muscle power. Special mention may be made of altered sensation, loss of muscle power and colic pain. In addition, as mentioned earlier, some unproved but suspected long-term hazardous effects of lead absorption are now receiving the attention of scientists.

In view of the known hazards of lead poisoning, and the fact that the precautions to minimise lead poisoning are being ignored in several industries, it is important that the areas of lead poisoning should be identified and publicized, as a first step towards forcing the concerned industries to take preventive measures. In this context it is encouraging to learn that recently environmental and health problem posed by some heavy metals (special emphasis on lead, zinc and cadmium) in workplaces were discussed at a national conference held in December, 1982, in Udaipur.

A report in *Business India* (December 5,1983) summarises the health hazards arising from lead poisoning. "They are likely to become anaemic because lead interferes with the production of red blood cells. And they are also likely to suffer from colic — a severe stomach ache and localised muscular weaknesses because lead also affects the nervous system. Serious lead poisoning can also lead to encephalopathy which can kill the workers. Its symptoms are delirium, paralysis or numbness of parts of the body, fits and coma".

VII. OCCUPATIONAL CANCERS

As technology makes rapid strides, more and more hidden costs of this technology are also being discovered, specially in the western countries. One of these areas which have evoked increasing concern in recent years is the impact of new industrial processes and materials on the workers handling them. Several concerned scientists and environmentalists, now list the increasing exposure to occupational hazards as one of the highest prices of progress that has been extracted entirely from persons who seldom get the due share of the benefits of their progress.

Cancer is a prominent health problem in the developed countries. In fact in the industrialised world cancer now accounts for one of every five deaths; only heart disease kills more people. In the US alone, cancer claims a thousand lives a day. Recently several experts have been coming out with more glaring evidence of the several occupational sources of cancer. In fact several of them believe that one fifth or perhaps even more of the cancer cases can be traced to occupational hazards.

Dr. R. Lobo—Mendonca has reported the following kinds of occupational cancer :

1. Carcinoma of the lung due to chromates has been reported from some countries in the manufacture of sodium bichromate and in the chrome colour industry.

2. Arsenic (including arsenical insecticides) occupational cancers.

3. Asbestos-related cancers. One of the most hazardous occupation is asbestos spray.

4. Benezol-related cancers. Benezol is used as a solvent in many industries. Efforts are being made to find less harmful substitutes. Mention may be made of its use in the manufacture of fine chemicals, waterproofing of cloth, rubber-cement and artificial pearls.

5. Cancers relating to coal-tar and its products, manufacture of coal gas, etc.

6. Cancer relating to X-rays and radio-active substances.

7. Cancers relating to petroleum dye intermediates. Workers in contact with dye intermediates, alphanaphthylamine, betanaphthylamine and

benzidine for a sufficiently long time suffer from tumours of the bladder, both benign and malignant.

In a research paper two experts of the School of Public Health, University of Illinois, Prof. Samuel S. Esteinad and Joel B. Swartz have identified the various sources of occupational cancer. According to them occupational causes of lung cancer include asbestos, nickel ores, chromium, arsenic, beryllium, mustard gas and vinyl chloride apart from incompletely identified carcinogens in a wide range of industries such as rubber, curing, tanning, steel (coke ovens) foundaries, automobiles and petro--chemicals. Lung cancer rates in asbestos insulation and top side coke oven workers are as much as 10 times greater than general population rates."

Lund cancer has a special relationship to occupation factors, and so does bladder cancer. Excess bladder cancer rates have been identified in several occupational categories, including rubber, paint manufacturing and textile dye workers. Excessive pancreas cancer rates have been reported in various occupations including steel and metal workers and organic chemists. As many as 50 per cent of the former workers at some plants that produce dye ingredients have developed bladder cancer.

A recent report of US Public Health Service on this issue has been prepared by nine highly reputed experts. This report is based on a National Occupational Hazard Survey which surveyed nearly 5000 work places which provided a cross section of industry in the USA.

This report tries to estimate the excess cancer attributable to the exposure of workers to six carcinogens, asbestos, nickel ores, benzene and petroleum fractions, including aro atics. To get this estimate, first the total number of workers exposed to these six carcinogens had to be found. Then the number of exposed workers was multiplied by the known risk ratios and 'normal incidence' of cancer was subtracted. In this way the number of excess cancers attributable to each of these carcinogens was obtained. The report concluded that "as much as 20 per cent or more" of cancers in the near terms and future may reflect past exposure to the six carcinogens considered".

Two other experts R. A. Stallones and T. A. Downs comment, "..... the full range of total cancers attributable to occupations exposure using multiple clarifications may be from 10 to 33 per cent or perhaps higher if we had better information or some other potentially carcinogenic substances..... the annual number of cancer deaths attributable to asbestos is in the range from 29,700 to 54,000.

In the context of asbestos-related cancers alone Barry Castleman and Manual J. Vera have written, As the first century of the modern asbestos industry drew to a close, the "Magic mineral" was proclaimed the largest single cause of environmental human cancer in the United States. The Secretary of Health, Education, and Welfare announced in 1978 that for the remainder of this century and part of the next, 17 percent of all US cancer deaths (over 50,000 per year) would be attributable to asbestos.

"Despite the best efforts of US health experts to predict the toll there is still uncertainty about these figures. Both high-concentration for exposure brief periods (hours or days) and far lower exposure for long periods are associated with some yet undetermined cancer risk. Asbestos dust inhalation has been linked to increased risk of cancer of the lungs, oesophagus, stomach, colon, rectum, kidneys, pleura and peritoneum. It has been the otherwise rare occurence of mesotheliomes of the pleura and peritoneum that has revealed the extent of the danger.

"In shipyards and other places where asbestos products were extensively used, mesothelioms has occurred not only in all the trades that worked around asbestos, but also among secretaries... Neighbours of shipyards and factories have contracted mesothelioma from ambient air pollution. Family members of asbestos workers and general ship-yard workers have developed mesothelioma."

Moreover, although this issue has been mostly discussed in the context of the developed countries it applies (pertinently) also to developing countries. In India thousands of workers are also exposed to several of the same carcinogens as in the developed countries, with the added hazards that here safety precautions to protect the workers from these cancer causing agents are minimal. Even in countries where the public consciousness and official concern regarding occupational cancers has increased rapidly in recent years, it has not been easy to estimate the incidence of this problem as several workers suffering from

occupational cancers are no longer workers in the jobs from where they had contacted this disease, and it is hardly surprising that in India very little reliable information on this subject is available. However, it is known that industries such as asbestos and dyestuff are serious health hazards, including the risk of cancer for a large number of workmen. It has been estimated that the asbestos industry in India employs about 7000 workers in 19 units spread in Andhra Pradesh, Gujrat, Haryana, Maharashtra and Tamil Nadu. About 20, 000 tonnes of asbestos is mined in Andhra Pradesh, Bihar and Rajasthan and thus a large number of miners are also exposed to asbestos fibre. Several multinational companies manufacturing asbestos products have been anxious because of the wider connections of the health hazards of asbestos in the developed countries to shift their operation to developing countries like India and some of them have already done so.

Medical surveillance in an asbestos textile factory of Ahmedabad carried out by the research staff of the National Institute of Occupational Health revealed the following facts :-

i) total and respirable dust and asbestos fibre concentration in the work environment were found much higher than tolerance level dust in this factory.

ii) the affected workers' population was young and was exposed to high level of asbestos dust; - the working and living conditions of the workers were very poor;

iii) Nearly half of the working population was having respiratory spmptoms in one form or the other and more than one fourth were having crepitation;

iv) the signs of malnutrition deficiency were present in many cases;

v) Nine per cent of the workers were having small regular or irregular opacities in chest X-rays;

Other studies in asbestos manufacturing units in India have pointed out the glaring lack of protective measures. Most reports on asbestos hazards in India have generally been confined to the incidence of asbestosis disease, while information on cancer of lungs and stomach has been difficult to get, for reasons stated above. However, the methods being used to suppress information even on asbestosis disease, as reported in *India Today* are notable : "There is a conspiracy to suppress information on the subject. Diseased workers are quietly pensioned off and authorities are bribed, and as a result there are few properly diagnosed cases of asbestosis on the records. The compensation for proven cases of asbestosis is so high that both the manufacturers and insurance companies prefer to suppress them".

Similarly in the dye intermediates industry, the workers health is being callously neglected. While ILO recommended a total ban on the manufacture of certain intermediates like benzidine and betanaphag-lamine which are known to cause cancer (and subsequently several countries have banned their manufacture) their manufacture continues in India. Benzidine is used on a large scale as the colours derived from it are in great demand due to their low cost.

According to a pilot survey conducted by the Indian Council of Medical Research a large number of workers in dye stuff industry in India suffer from cancer of the urinary system. The ICMR has planned an apidamiological and experimental study to investigate the urinary tract cancer risks among the workers.

In view of the above facts it is not at all unlikely that if a detailed study is made, the incidence of occupational cancers may be revealed to be quite high in India.

As a first step in the direction, it is important that the experts in organisations like the National Occupational Health Institute, Industrial Toxicological Research Institute and the various cancer research institutes and hospitals should make efforts to make available more extensive and reliable information which would enable the labour departments, trade unions and other enlightened citizens to strive for better protection for workers.

VIII. OTHER ASPECTS OF OCCUPATIONAL HAZARDS :

Noise :

Exposure to excessive noise is known to cause annoyance, mental and muscular tension. The available data on the impact of high noise level on industrial workers suggest that greator circulatory, heart and equilibrium problems can result. The most frequent damage experienced by those having prolonged exposure to noise is damage of hearing ability, including permanent incurable deafness.

The Indian Factories Act does not specify any measures to protect workers against high noise level. The few studies on this aspect of occupational hazards have revealed noise levels in Indian factories to above permissible limits.

Thermal Stress :

According to an article in *'Science Today'* by S. Kumar "with sustained temperature beyond 100^{0}F (37.7^{0}C) and relative humidity of 80-90 per cent, a worker may experience heat stroke, vomiting, giddiness, nausea and may also become unconscious. There is a rapid increase in the rate of heartbeats and often a severe headache grips the worker. Abnormal thermal stress reduces the appetite and, consequently, most of the workers lose weight within a few years. A WHO study observed that heat stress might also play a role in causing or aggravating hypertension, "An epidemiological study of workers in steel rolling mills who were exposed to excessive heat from the furnaces showed a significantly higher prevalance of hypertension. The study blamed prolonged exposure and excessive heat as the main causative factor."

According to an expert Dr. N. L. Ramanathan, "It is very important that in circumstances of severe heart stress, the regimen of work and rest spells must be planned carefully after due scientific scrutiny, so that the workers are not subjected to any undue physiological strain".

According to available reports Indian workers are exposed to extreme forms of thermal stress in several industries ranging from giant steel plants to small scale glass manufacturing units to brick kilns,

Toxic chemicals :

According to Dr. V. A. Shenai, "About 15,000 chemical compounds are widely used in industry, agriculture and commerce. Yet only a few have been thoroughly investigated as to their adverse effects on human health" ... inhalation of sulphur dioxide, sulphur trioxide, carbon disulphide, etc. has been shown to increase the incidence of coronary diseases; it also brings about changes in blood chemistry and reduces the brain's ability to exert control over muscle movement. Excessive exposures can lead to fatalities.

Then there is the risk of skin damage. particularly in the finishing department. Direct contact with acids, alkalies, oxidising agents, reducing agents, detergents solvents and resin precondensates can cause immediate damage in the form of burns or can produce long-term complaints like dermatitis, eczema and other skin diseases. The eyes, the mucous membranes of the nose, the fingers and the hands are highly susceptible. Exposures to harmful chemicals is known to be acute in pertoleumbased industries. A recent article in *Science Reporter*, March, 1982 informs us that exposure to petrol can cause both acute and chronic toxic symptoms. The precise toxicology depends on the chemical composition of the petrol in question. Exposure to petrol is a potential hazard when it is used or stored in an enclosed place; or when storage tanks are improperly purged and ventilated before entry for cleaning.

"Petrochemicl industries depoly a work force of about 100, 000. Refineries and big processing units of petroleum products adopt "closed processes" which lessen the chances of exposure to harmful compounds. But most smaller units working with petroleum products do not take proper precautions and workers are likely to get exposed to petroleum products. This is particularly true of rubber, paint and varnish industries, shoe industry, degreasing and dry cleaning units, plasticizer and plastics industry and even petrol pump workers. Those running transportation and tanker fleet are also liable to get exposed to petroleum derivatives".

Mental Stress :

According to an ILO study, day-to-day job stress could produce physical illness, emotional upsets and family problems for workers. The "stress sickness", particularly on repetitive jobs can create physical and emotional exhaustion and can lead to an insidious

sense of helplessness, this study in occupational health series has pointed out.

The Role of Trade Unions :

Generally trade Unions in India have shown a shocking apathy towards occupational health questions. Their concern has been with wage increase, bonus and related demands, and the question of occupational hazards has generally been raised only in the context of getting compensation after the damage has been done.

However, in Dalli-Rahara the Union of Iron Ore Miners 'Chattisgarh Mines Shramik Sangh' has started a health programme aimed at providing a relevant system for the workers. Both the Union Leaders and the doctors working for the Union revealed a high degree of consciousness regarding occupational health questions when I talked to them recently. In the near future this Union can be expected to undertake pioneering work in this area. Similarly the United Mineral Workers Union active in the asbestos mines of Roro in Singhbhum district of Bihar has done praiseworthy work in drawing attention to the health hazard faced by these miners.

WORLD'S GREAT INDUSTRIAL DISASTERS

Year	Place	Description	Casualty
1921	Oppau, Germany	Explosion at multinational BASF chemical plant	561 dead
1942	Honkeiko Colliery, China	Coal dust explosion	1,572 "
1947	Texas City, USA	Ammonium Nitrate Fertiliser laden ship explosion after hitting another ship. Multinational Monsato involved	561 "
1956	Cali, Colombia South America	Dynamite truck explosion	1,100 "
1974	Flixborough, UK	Chemical plant explosion	28 "
1975	Chasnala, India	Coal mine flooding	431 "
1976	Sudamdih, India	Coal mine explosion	43 "
1976	Seveso, Italy	Chemical plant explosion due to leakage of highly toxic dioxin gas	700 evacuated, hundreds of animals killed, 100 people affected by skin diseases. Cleanup not completed.
1979	Novosibirsk, USSR	Accident at biological and chemical warfare plant	300 dead
1980	Port Elang, Malaysia	Chemical cylinder explosion	3 dead and 200 injured.
1981	San Rafael de Laya, Venezula	Gas pipeline explosion	18 dead, 35 injured.
1983	Pojuca, Brazil	Gasline-laden train explodes	99 dead while collecting leaking fuel.
1984	Cubata, Brazil	Gasline pipeline explosion	500 slumdwellers killed
1984	Mexico City, Mexico	Natural gas plant explosions at State-owned Pemex plant	452 dead, 31,000 residents evacuated.

Appendix

I. RADIATION HAZARDS :

This is a highly controversial subject. For this appendix we have depended heavily on an excellent report on this subject published in the *Economic and Political Weekly* by a correspondant with inside knowledge of the health hazards at the Nuclear Fuel Complex, Hyderabad. As this report very rightly points out reactor-accidents and harmful radioactive leakage have occurred in practically every country having nuclear facilities and India is no exception in this regard.

Describing the nature of these health hazards in general, this report points out, "Unlike most other hazards, one cannot see, taste, smell or feel radiation, even when one has been fatally exposed to it. Again doses of radiation are cumulative, i. e. constant exposure to 0.1 rem (radiation exposure man) per two months can result in a yearly exposure of 0.6 rem. Short term effects of intense exposure of radiation (10,000 rem in hours, or 100 rem in weeks) can include death from radiation, sickness, sterility, burns, hair loss, etc. Long term effects of lesser exposure over years or decades (1-10 rems) can include an elevated risk of all types of cancer, genetic defects, and childhood cancers to children or mothers whose foetus was exposed in pregnancy.

In the specific context of the health hazards at NFC this report notes, "In the uranium oxide plant there is uranium powder in the air and on the floor. In an

effort to meet production demands, workers are exhorted to handle the uranium powder if necessary. There is the case of a senior officer of this plant actually handling the powder with his bare hands to set an example to the workers and attempt to reassure them about the hazardous nature of this powder. Whether this act was one of bravado or foolishness, it needs to be severely condemned. An institution dealing with nuclear fuel and claiming to impelement IAEA safety regulations, many times more so than ordinary industries. Surgical rubber gloves are given once in six months for handling the uranium powder, but if the gloves are used regularly they don't last more than a week. Face masks are also provided but these so quickly get clogged with the dust that workers begin to feel suffocated within 10-15 minutes of putting them on. Therefore, they resort to the expediant but inadequate method of tying a handkerchief around their faces.

"Safety regulations in the other plants of NFC are no better. Chlorine leakage occurs frequently in the zirconium sponge plant. Chlorine can be damaging to the eyes and respiratory tract. The conversion of zirconium oxide to zirconium tetrachloride requires temperatures of 1000°C. Inadequate temperature control at the work place exposes workers to temperatures much above the normal. High temperatures can have a variety of ill-effects, one of which is sub-fertile sperms. There is a complaint amongst some of the workers in this workspot that their wives have been having repeated abortions. Since repeated abortions have been linked to sub-fertility of sperms it is obvious that this problem needs examination.

"On March 26 one of the boiler pipes in this plant exploded causing the steel plate covering the pipe to burst through the roof. Fortunately no one was injured as it was a holiday.

"Accidents have occured with workers inhaling toxic fumes of nitrate and sulphur dioxide and having to be revived in hospital followed by a period of ill-health. Workers develop long-term effects by being exposed to small doses of fumes over a period of time. No wonder then that a large number of workers suffer from, frequent attacks of chest pain, bronchitis, bronchial asthma and othe allergic manifestations. Loss of appetite, weight reduction, dark pigmentation of the skin, feeling of ill health etc. are encountered so frequently that workers become apathetic in spite of the knowledge that these problems are due to chemical effects."

"In the zirconium oxide plant alkali dust in the air makes workers complain of a burning sensation and pain in the chest. Sulphur dioxide present in the range of 20-40 ppm (mpl 0.1-0.3 ppm) frequently exceeds its tolerable limits. The uranium oxide plant has niturate fumes in the range of 30-50 ppm (mpl 0.05-0.5 ppm) and this can cause severe headaches in the workers, thus precipitating accidents. Tough masks are given in the grinding, blending and ammonium diuranate cake areas, the wet areas with nitrous oxide fumes are catered for". The same report points out that the medical care available to these workers exposed to extreme health hazards is quite inadequate.

Praful Bidwai reported in the *Times of India* (May 9,1983), "The Tarapur atomic power station, which has broken several world records in exposing nuclear plant workers to excessive doses of harmful radiation is now crippled by the very high levels of radioactivity present in it.

"The limits are measured in rem the unit of effective radiation absorbed by body tissue. The maximum permissible limits for individual radiation workers are 5000 millirem (rem) per year, subject to a maximum of 3000 millirem per quarter and 400 millirem in a fortnight.

"However, TAPS has exposed more than 300 people to annual doses exceeding 5000 millirem. In 1979 and 1980 some workers absorbed over 5900 millirem. And in 1976, 1977 and 1978 the highest doses absorbed were dizzyingly high : 18,240 millirem 16,000 millirem and 11,320 millirem respectively. Many more workers have been exposed to doses well above the quarterly and fortnightly limits".

A Special Correspondent wrote in *Sunday*, on the conditions in Tarapur, "the reactor which is working, albiet at a slow pace, with cracking by-pass tubes, little puddles of radio-active water under a callous plainly inefficient management. In their air-conditioned glamour, the Power Project Engineering Division sit pretty in Bombay. Statements couched in elegant language for the consumption of the public and the Lok Sabha are the only job of these top management people. The hard working breathless engineers are up with heart attacks and incurable insomnia".

According to another report in the same issue of this magazine. "The BARC officers feel that the so called pin-hole leaks at Tarapur could have been rectified by now had the officers been taken into confidence. When the first leaks appeared, some engineers had suggested that the wisest thing to do under the circumstances would have been to take out fuel rods and empty the calendria. But they were overruled".

Dr. K. Jayaraman, a prominent science journalist wrote about this accident. "It is obvious that any basic safety requirements would have demanded a back-up device which, in this case, despite procedural requirements as specified by the safety committees, was not maintained. And after this incident, the helpless technicians had to struggle. There have been persistant reports that Tarapur maintanence staff are over-exposed to radiation.....DAE claim that it had never hushed up accidents has lost credibility in the light of the manner in which it handled the publicity of the 14 March incident in the coolant system of unit one of Tarapur".

Health hazards of X-ray technicians :

Pushpa Girimaji, a reporter of the *Indian Express* who carried out a survey of the health hazards of excessive radiation exposure among radiographers and patients in Delhi and surrounding areas concluded, "Hundreds of radiographers, as well as patients visiting hospitals face the danger of unwarranted exposure to radiation through the indifference of health authorities to the recommendations of the Directorate of Radiation Protection, Bhabha Atomic Research Centre (BARC) and the International Commission on Radiological Protection (ICRP).

"A visit to certain diagnostic X-ray units in the city revealed a shocking state of affairs. Besides private diagnostic centres, district hospitals and public health centres, even certain major government hospitals in Delhi brazenly flout radiation protection rules".

Another journalist Vimal Balasubrahmanyam who carried out a similar survey in Calcutta reached a similar conclusion. "At a prestigious postgraduate teaching hospital in Calcutta, technicians working in the X-ray and nuclear medicine departments narrate umpteen instances of the effects on people working in the radiation field : a woman technician having three abortions and then becoming sterile : a girl in her early 20s developing leukemia after completing X-ray technician's certificate course; other technicians becoming grey, bald and anaemic... These things can happen to anyone, but they happen more to workers exposed to radiation. Why ? On paper there exist stringent criteria regarding maximum permissible radiation exposure limits, and minimum protection norms. In practice these are often not enforced. It is a sad commentary on our health system that the heads of medical departments are bureaucratically indifferent to the health hazards faced by their own technicians who play a vital role in diagnostic medical practice".

Speaking about the private X-ray clinics, this survey noted, "At private X-ray clinics, the technicians are most often boys who have done high school and have learnt to operate machines on the job. Their salaries are dismal. They receive no formal instructions on radiation hazards".

According to a recent release of the Press Trust of India, "Large number of X-ray clinics spawning all over the country pose a direct health hazard to the people, according to a report of the Bhabha Atomic Research Centre (BARC). The conditions of radiation protection in 80 per cent of the estimated 18,000 diagnostic units are far from satisfactory and they subject the public to considerable risk, the report of the division of radiological protection (DRP) of BARC said".

II. CHILD LABOUR :

Children are frequently employed in highly tiring, unhealthy, degrading and hazardous occupations which can permanently damage their chances of leading a normal life. According to information given recently in Parliament there is a concentration of child labour in certain industries such as match industry in Tamil Nadu, Carpet industry in Jammu & Kashmir and Uttar Pradesh, slate quarries in Madhya Pradesh, diamond cutting in Gujarat, glass in Uttar Pradesh, tea-plantations in West Bengal and brass--ware in Uttar Pradesh. News reports and studies on almost all these industries have extablished the inhuman work conditions that exist for children employed here. To this should be added degrading employment in small hotels, bidi making and some other areas.

EXTRACTS FROM THE REPORT ON CHILD LABOUR IN SIVAKASHI BY SMITU KOTHARI FOR PEOPLE'S UNION FOR CIVIL LIBERTIES & LOKAYAN

"The Working conditions in the industries are unsafe and obviously detrimental to the mental and physical health of the child. Most children who work have not been to school at all. Staying a total of fifteen hours away from home, twelve at work, they work in cramped environments with hazardous chemicals and inadequate ventilation. Dust from the chemical powders and strong vapours in both the store-room and the boiler room were obvious at practically every site we visited.

"Physically, safety precautions seemed to have been maintained, but on closer scrutiny we found that small sheds with a pile of gun-powder in centre of the room where legally only four people could work, had at times eight people making fireworks. In two sheds, dust from the activities was evident all over the room. Village doctors. for example, in Kangerseval, mentioned a high incidence of respiratory complaints but no systematic investigation has, as far as we could investigate been undertaken. In the dyeing section, where newsprint is dyed the characteristic red for the outer wrapper of the fire works, all the workers were children. Even in the packaging department a majority of the workers were male children.

"We subsequently visited over half a dozen more fireworks units. The conditions are more or less the same as outlined except in two small units close to the standard unit at Tayyalpatti where we found two kerosene lanterns in the corner of a shed. Legally, work in the entire fireworks unit has to stop at sundown. When asked about the lanterns, the foreman said that they belonged to some workers who had to walk a long distance to their villages in the night. It is common knowledge that in many of these units, work goes on in the night. Accidents are frequent and as documented earlier, can be caused by just a spark.

"The chemicalsused in this whole process are Tetro phosphorous, Red phosphorus, Potassium chlorate, antimony, Tri Sulphite, Zinc Oxide, Calcium Sulphate and Asbestos powder.

"The working conditions in the entire unit are very poor. As is evident from the above list, the occupational conditions in the various production stages are hazardous. Very few units have proper ventilation. In the room where the chemical gum is prepared for tipping the sticks, dust and fumes were evident in all the units we visited. As mentioned earlier, no systematic study has been undertaken to investigate the various kinds of respiratory and other diseases that would definitely be ensured from this kind of activity. The situation is, in fact, even more critical in the small cottage units where the rooms are small and all the activities take place in one room. As mentioned earlier in the report, puddles of chemicals, chemical dust, poor ventilation and over crowding were evident in most of these units".

Brass Industry in Moradabad

A lot of brassware is exported to gulf countries as well as to western countries from Moradabad, UP, where this industry is concentrated. Most of the work is done by the articians in their residential premises which are generally cramped and unhygenic with poor lighting and ventilation. According to a report in the *Economic Times* "excessive heat, injurious gases, metal dust etc. are the components of the enviroment in which they have to work." Specially the plight of the nearly 6000 children engaged in this industry is deplorable. Those engaged in scraping and polishing inhale dust and metal particles. Their eyes are also affected by this. The solution used for polishing contains a poisonous chemical. Several of the articians become the victims of tuberculosis at a very early age.

III. ESIS - WORKER'S HOPE OR DESPAIR :

A wide network of hospitals set up throughout the country under Employee's State Insurance Scheme (ESIS) today are the leading avenues of medicare for industrial and other workers. Till July 1981, the E.S.I. Scheme covered about six million employees or about 27 million beneficiaries. About 1036 dispensaries had been set up under the scheme and the services of an additional 4734 clinics of private doctors were utilised for out-patient treatment.

Impressive as this infrastructure and its wide structure and its coverage may appear, questions have often been asked regarding the quality of medicare offered by ESIS and the answers available from at least some studies hardly present a satisfactory situation.

A study undertaken by the Indian Institute of Management, Ahmedabad, which was based on a sample survey of 1949 (covered persons in Ahmedabad) found that workers were either not satisfied with remedial benefits of ESIS of the satisfaction was very low. Over 80 percent of the insured persons expressed dissatisfaction with the quality of medicine and drugs they get from the ESIS dispensaries.

This dissatisfaction is based on good reason. The study found in the course of its survey of the ESIS dispensaries that "some doctors do not use the required diagnostic apparatus and also do superficial examination of the patients. They seem to be inexprienced and incompetent and refer the patients to specialists for minor ailments." This report also said that ESIS dispensaries "lack basic requirements like diagnostic equipment, laboratories, proper facilities for sitting and even drinking water."

A recent news report on the available ESIS facilities on the Ballabhgarh — Faridabad industries said, "The minimum that Ballabhgarh and Faridabad needs is at least three full-fledged ESI hospitals of 500 beds each and 60 dispensaries against one 200-bed hospital and 14 ESI dispensaries at present 42 of the total 144 posts of doctors pharmacists and para medical permanent personnel for ESI are lying vacant for well over two years." This report also notes that while the incidence of TB among the industrial workers is high there is no separate TB clinic in the region. Again, while a large number of burning cases are caused in industrial accidents none of the ESI clinics have a full fledged 'burns' unit.

Inadequacies of facilities apart, a particularly vexing problem in the implementation of ESIS is the problem created by false medical certificates. Under ESIS a worker is entitled to be compensated for loss of wages upto 91 days in a year when he is sick and does not have any other leave to his credit. When a worker is having a chronic disease, he gets wage benefits upto 309 days. If a worker suffers injury during the course of work, the wage benefit is doubled and there is no time limit also. This provision has been however misused by some workers to submit false certificates and obtain paid-leave for long periods. The situation can prove particularly troublesome when some unscrupulous but powerful union leaders pressuries the doctors to issue false medical certificates on a large-scale to their supporters.

While it is frequent to hear workers complaints about the ESIS doctors and quite often these complaints are genuine — one should also look at the point of view of the doctors. There is considerable dissatisfaction among these doctors, at some places, regarding the salary and other benefits they get compared with the doctors working in other hospitals. Moreover it is too much to expect the doctors to satisfy the patients if there are glaring shortages of medicines, equipment and beds.

While there are several ambitious proposals about the future expansion of ECIS, it should be remembered that the medical facilities have to be made available by the State Governments and in the past n any State Governments have not cooperated with the ESIS to the desirable extent in acquiring land, establishing hospitals, equipping them properly, etc. Another problem in the mode of expansion of ESIS is that arrears in the collection of contributions has been mounting with the result that the financial viabilties of several expansion plans is adversely affected.

The ESIS recently recommended that workers drawing wages less than Rs. 6/- a day should be exempted from paying employee's contribution. At its recent annual meeting in Delhi the corporation also approved increase in the rate of disablement and dependent benefits from 125 per cent to 140 per cent and of the standard benefit rate from January 1,1981

These are welcome changes, but some structural problems confronting the ESIS are not reduced by such steps. The health of industrial workers in our country is very poor. They are affected by a large number of occupational diseases and exposed to several hazardous working processes. The rate of industrial accidents is also very high. Last, but not least, the poor nutritios standards and unhygenic living conditions of workers also expose them to a number of diseases. Given such conditions the task before the ESIS is an enormous one and it has not been possible yet to get adequate funds sanctioned for providing proper medicare to the workers. Also the utilisation of the available funds leaves much to be desired.

IV. RESEARCH ON OCCUPATIONAL HEALTH : CASE-STUDY OF THE WORK AT NIOH :

Reflecting the growing worldwide concern over occupational hazards, there has been a rapid increase in research on this subject, specially in the developed countries. In India also several research institutions, some of them of recent origin, have been carrying out research on occupational risks including the National Institute of Occupational Health (NIOH), Ahmedabad, Industrial Labour Institute, Bombay and the Central Mines Research Station, Dhanbad. In terms of specific orientation towards the study of occupational health issues in their wider framework of a developing country's needs, NIOH which also has regional centres at Bangalore and Calcutta is perhaps the most important research institute in this field in India.

NIOH'S work on occupational health problems is broadly divided into four sectors - agricultural sector, unorganised small scale industrial sector, organised large scale industrial sector and the 'self employed sector'. Examples of its research work in these various sectors reveal the nature of occupational health problems as well as the seriousness of health risks even in occupations commonly not considered very dangerous.

Labourers engaged in tobacco harvesting frequently experience dizziness, nausea and vomitting. A epidemiological study with X-ray, lung function, urine and blood tests was undertaken to ascertain the incidence of 'green symptoms' among 290 tobacco workers handling cured or uncured tobacco workers handling cured or uncured tobacco leaves. The frequency of symptoms was found to be very high. It has been found that tobacco harvesting causes respiratory or neurological problems and increased nicotine content in the urine.

There has been some controversy of the exact reasons why tobacco harvesting leads to the health problems. According to some scientists it is the absorption of the nicotine content in tobacco through the skin which is responsible, while according to other scientists the damage is done by the inhalation of a fungus growth in tobacco leaves. Unravalling the exact causes of the health problem can lead to the possibilities of finding simple, inexpensive cure for the health problems among the tobacco labourers. One such solution which is already being tried is for the harvesters to tie an appliance on their fingers to avoid excessive direct contact with nicotine.

In the unorganised industrial sector, enviromental-cum-medical surveillance was carried out in small scale potteries. Several workers engaged in this small-scale industry were found to be victims of the dreaded respiratory disease, silicosis which has already attracted widespread attention in the context of the slate pencil workers of Mandsaur. The free silica and other dust concentrations were higher than the tolerance limit in all the departments of pottering except in the packing departments. There was close association between duration of work in the potteries and prevalance of silicosis. Prevalance of silicosis was closely related to the respirable dust concentration and its free silica dust contents. While surveying the conditions in small to medium ceramic industries it was revealed that an acute thermal stress problems existed in kiln unloading operations.

The significance of this kind of research is that only on the basis of such reliable factual information can the labour department or other enforcement agencies make a strong case for the introduction of dust control and other protective measures. In the absence of such research, it is easy for factory-owners to blame the poor health conditions of the workers on their unhygenic living conditions, addiction to liquor and other such factors, and thereby side-track the issue of occupational risks and the necessity to curb them. Given the correct state of the implementation of labour laws in our country, it is of course not certain that even such evidence of the existence of occupational-related disease will necessarily bring

forth the badly needed protective steps, but at least it may be stated that the information in such hazards collected by research work increase the chances of such protective steps being taken.

The same holds true for the Institute's work on workers in the organised sector. Recently in developed countries workers of asbestos factories have been singled out as among those who are most exposed to occupational risks. NIOH has already undertaken considerable work on asbestos workers, and plans to extend it to more factories and mines. An environmental-cum-medical surveillance of an asbestos cement factory in South India revealed that the dust and fibre concentration in the work environment of this factory were found higher than the tolerance values. The exposed workers were mainly having chronic cough with expectoration and dyspnoea either alone or in combination with each other. Symptoms present in exposed workers suggested the presence of restrictive type of lung dis--orders in the workers working for more than 20 years. The radiological evaluation of chest X-rays of the exposed workers showed small, regular as well as irregular cavities which may be due to mixed exposure to silica as well as asbestos.

In the area of self-employed workers, NIOH has taken up the health problems of hand-cart pullers of Ahmedabad (in this city hand carts are often pulled by husband and wife teams) constant friction with the bar during pushing hand carts leads to thickening of the skin of the lower abdomen in females and the upper part of the thigh in the males. This in turn, lead to cases of abortion and frequent menstruation-related problems among the female cart-pullers.

Having located this problem, efforts have also been made to reduce this health risk to female cart-pullers by redesigning the cart in such a way that the burden of it is shifted from the abdominal muscles to leg muscles. In addition, to reduce the risk of the workers being over-run by their heavily loaded carts on slopes, brakes have also been provided in the new carts. Some space has also been provided in the new carts for carrying a child. The first of the new cart was expensive but subsequently efforts have been made to reduce its cost.

Thus both by providing specific information on occupational risks and occasionally by suggestive practical steps to reduce risks research institutes such as NIOH play relevant role in reducing occupational risks. However, it is frustrating for these researchers that many times research made by them remains confined to acadamic journals, as the Institute has no authority or powers to ensure the protective steps found necessary by its research findings are actually implemented. In addition they also face several problems in gaining access to industries in which they intend to carry out research work.

V. OCCUPATIONAL HAZARDS IN RAYON INDUSTRY :

Recently occupational hazards in the rayon industry have been widely discussed, specially as a result of the publication of a study by V. T. Padmanabhan titled 'The Gas Chamber on the Chambal'. Among other things this study has described the gas-poisoning to which workers in Gwalior Rayon Silk Mills (GRASIM) Nagda, Madhya Pradesh, are exposed. More specifically the disastrous results of the exposure to hydrogen sulphide, sulphur dioxide and carbon di-sulphide are described. According to this study 15 workers of this factory died due to work-related diseases in 1982 while 27 others were suffering from serious ailments like paralysis and heart disease. Much earlier an official report had described the occupational health problems in rayon industries.

The Report (Survey of Carbon-di-sulphide, Hydrogen sulphide and Sulphur dioxide Hazards in the viseses Rayon Industry in India) was prepared by a Committee of three scientists Dr. Harihara Iyer, TD Raisinghani and Dr. M. N. Gupta. The team on behalf of the government studied the situation in three Rayon factories in India.

The Committee found that the situation in many departments was alarming. It stated, "The CS_2 retort attendents in all the factories were thus found to be exposed to toxic concentrations of sulphur--dioxide. The same observation holds good in the case of most of the spinners in the three factories and to the churn room helpers in two of the factories. The 'spinning after treatment tank attendents' in one of the factories were also likewise exposed to concentration of the gases exceeding the threshold limits. Suitable remedial measures to safeguard the health of the workers are urgently called for".

The Committee observed more than 75 symptoms, most of them attributable to the damage caused to the nervous system. A few among them are memory defects, sleeplessness, loss of interest in sex, chronic fatigue etc. About half the workers were found to be victims of the hazards.

According to another study of a rayon plant by Raghab Bandyopadhyay, Mundrika Singh worked for ten years in the CS_2 plant at Kesoram Rayons. Sushil Pramahik survived only five years and Nimai Pandit just one. Then there were Mangeshwar Prasad and Chandrika Yadav. All five are now dead. The production process in the CS_2 plant, in which charcoal and compounds of sulphur are burnt together, had no mean part to play in their demise. Workers here are afflicted by respiratory troubles, sleeplessness, loss of appetite and a lowering of the natural resistances of the body to a point where they become victims of various terminal illnesses. These are only some instances of the widespread effects of hazardous industrial conditions.

"Visit the Spinning room at Kesoram Rayons and you will find from those working there daily with a liquid called the 'spin bath' about large sores of the fingertips, nervous illnesses such as fatigue, headache nausea, muscular failure, sexual impotence and psychological disorders. Workers in the spinning departments have inflamations in the eye and many complain of poor eyesight all because of the effects of H_2S gas. Even their clothes tend to wear out with unusual rapidity."

Conclusions & References

I. CONCLUSIONS :

Some aspects of occupational accidents and diseases have been presented above. But this should not create the impression that the occupational health issues are confined only to some particular types of accidents or well-known diseases. This would be a very narrow view of the problem.

To discuss the wider dimension of occupational health questions in India, the poorest occupational group in India consists of milions of landless or near-landless agricultural labourers who have to toil, often in adverse weather conditions on a poor quantity diet. This type of work itself ruins the health in several ways, and we do not always have to think in terms of poisonous gases or toxic chemicals.

A study of female agricultural labourers in rice production by Joan P. Mencher and K Saradamoni titled "Muddy Feet, Dirty Hands" (EPW, December, 1982) has described the long-term effects of paddy transplanting work on the health of women farm labourers. "Higher wages should be paid for work which requires bending over most of the time while standing kneedeep in water, having one's legs attacked by leeches, and often not being allowed to straighten out one's back even for a few minutes. Transplanting is both a hazardous and skilled job. It is hazardous because of the illness to which it

exposes the women, which include a variety of intestinal and parasitic troubles, infections, splitting heels (from standing in muddy water for hours on end), severe pain from the leech bites, and ultimately the possibility of crippling ailments like rheumatic joints and arthritis. It is not rare to find old women, who have spent more than 40 or 50 years of their life transplanting paddy, permanently bent over and unable to stand up straight at all. Unfortunately nobody has cared to study these problems. Transplanting is also an extremely skilled job. If the seedling are not put at the correct distance, or deep enough, or if the ground is not patted down properly afterwards, the plants will not grow correctly. Yet because it is done by women, it is usually regarded as a simple and not very skilled job."

The only encouraging aspect of the distressing occupational health scene in India is that recently the concern being expressed over the present day dismal state of affairs has increased significantly. Whether we look at press coverage, or public litigation cases, or even the official statements on this subject, it appears that there is greater realisation of the immense distress carried by the neglect of occupational health, and of the need to take protective steps.

In March, 1984 the Economic Times reported, "The Union Labour Minister, Mr. Veerendra Patil, today introduced a Bill in the Rajya Sabha abolishing the current wage limit for payment of compensation to workmen for their dependents in case of injury, disablement or death caused by accidents during employment.

The proposed revised rates of compensation, Mr. Patil said were based on the rates specified in the ILO convention concerning minimum standards of social security, except that the compensation payable in respect of those drawing wages exceeding Rs. 1,000 per month was proposed to be restricted to the amount payable on the wages of Rs. 1,000 per month.

The Minister said Section 4 of the Act provided for payment of compensation at the rates specified in Schedule IV of the Act. These rates, he said, were last revised in 1976 and there was a demand for its upward revision. Further, the amount of compensation was at present determined without reference to the age of the workmen. This was not considered fair.

"It was, therefore, now proposed to provide for payment of compensation in terms of percentage of monthly wages linked to the age of the workman at the time of his disablement or death,

"Mr. Patil said the list of occupational diseases specified in Schedule III of the Act was also proposed to be substituted by a revised list, which was based on the revised list of occupational disease adopted by the ILO in 1980."

Again on May, 11,1984 the same newspaper reported further government efforts in this area, "A working group of the Labour Ministry has suggested the enactment of a general legisislation dealing with safety, health and welfare at work. It has also indicated the ingredients that should be incorporated in the law.

"The working group was set to examine the unification of various laws covering safety and drawing up programmes to help small units in safety efforts. The working group will soon submit its report to the government.

"According to this group, the law should provide for declaration by every employer of a safety policy with respect to the safety and health of workers, maintaining it up-to-date and communicating the contents to all workers. The policy should also contain the organisation and arrangements necessary to carry it out.

"It should lay down clearly that the employer has the duty to ensure the safety, health and welfare at work of all workers."

Recently PTI reported, "the dangerous Machines (regulation) Bill moved by Agriculture Minister Rao Birendra Singh was accorded all round support in the Lok Sabha on Thursday.

"The bill, Mr. Singh said, provided for the regulation of trade and commerce in the production, supply, distribution and use of dangerous machines in the interests of operators and for payment of compensation or death or bodily harm suffered while operating it."

However, these and other relatad legislative actions can hardly be regarded as heralding remarkable improvement in occupational health in India. Only a detailed analysis by legal experts will reveal to what extent loopholes still remain in these laws. Further the major problem is at the implementation level. In

the existing conditions of India where in most employments the employees are fully subservient to the employer who alone determines the working condition and where protective laws generally are no more than minor irritants for the employer, better laws cannot mean much by themselves. Lack of adequate manpower and infrastructure as well as corruption have crippled the functioning of the implementation machines. Trade Unions, where they are powerful, generally continue to neglect occupational health related issues. Even after extensive coverage of occupational health problems in slate pencil industry in the press and administrative action which followed it more recent reports indicate that the situation there has not improved in a significant way.

This brings us to the inescapable conclusion that the revolting exploitation and poverty that is predominent reality of India today, straight-foward solution to occupational health problems may not be available in several contexts. Extreme poverty and hunger may force workers to accept very hard working conditions in jobs which at least ensure families some regular supply of food. Taking advantage of their poverty these employers sometimes offer them a choice of this or nothing. In other words either they should accept the terrible working condition or else face the prospects of the quarry or the industry being closed down at least temporarily. Quarry and brick-kilns workers around Delhi and asbestos workers in Bihar have faced unemployment in recent times, in the wake of attention being drawn to their hazardous working conditions. This is not to discourage efforts in this area, but to warn that only limited improvement may be possible within the existing exploitative and oppressive system, and the wider struggle has to be for changing this system.

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